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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

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Operation and Maintenance Manual

D250E Series II and D300E Series II Articulated Trucks

4PS1-Up (Machine)
5KS1-Up (Machine)

i01632096

Maintenance Interval Schedule

SMCS Code: 1000; 7000

Note: All safety information, warnings, and instructions must be read and understood before you perform any operation or any maintenance procedure.

Before each consecutive interval is performed, all of the maintenance requirements from the previous interval must also be performed.

When Required

Battery - Recycle 123
Battery, Battery Cable or Battery Disconnect Switch - Replace 124
Cab Air Filter - Clean/Replace 128
Circuit Breakers - Reset 129
Engine Air Filter Primary Element - Clean/Replace 139
Engine Air Filter Secondary Element - Replace .. 141
Engine Air Filter Service Indicator - Inspect 141
Engine Air Precleaner - Clean 143
Ether Starting Aid Cylinder - Replace 146
Frame and Body - Inspect 147
Fuses and Circuit Breaker - Replace/Reset 153
In-Line Refrigerant Dryer - Check and Replace .. 159
Oil Filter - Inspect 160
Radiator Core - Clean 163
Seat - Inspect 163
Seat Belt - Replace 164
Walk-Around Inspection 174
Window Washer Reservoir - Fill 176
Window Wiper - Inspect/Replace 176
Windows - Clean 177

Every 10 Service Hours or Daily

Backup Alarm - Test 122
Brakes, Indicators and Gauges - Test 126
Cooling System Level - Check 133
Differential and Final Drive Oil Level - Check 138
Engine Oil Level - Check 143
Fuel Tank Water and Sediment - Drain 153
Hydraulic System Oil Level - Check 157
Oscillating Hitch - Lubricate 162
Suspension and Suspension Cylinder Bearings - Lubricate 166
Tailgate and Tailgate Cylinder Bearings - Lubricate 167
Tire Inflation - Check 167
Torque Converter, Transmission, and Transfer Gear Oil Level - Check 171
Wheel Nut Torque - Check 176

Every 50 Service Hours or Weekly

Body Pivot Bearings - Lubricate 124
Hoist Cylinder Bearings - Lubricate 154
Steering Cylinder Bearings - Lubricate 164

Initial 250 Service Hours (or at first oil change)

Engine Valve Lash - Check 145

Every 250 Service Hours or Monthly

Air Conditioner - Test 121
Axle Breathers - Clean/Replace 122
Battery Electrolyte Level - Check 123
Brake Pads - Check 124
Braking System - Test 127
Cooling System Coolant Additive (DEAC) - Add .. 132
Engine Crankcase Breather - Clean 143
Engine Oil Sample - Obtain 144
Engine Oil and Filter - Change 144
Fan Drive Bearing - Lubricate 146
Hydraulic System Oil Sample - Obtain 158
Oscillating Hitch - Adjust 161
Secondary Steering - Test 164
Torque Converter, Transmission, and Transfer Gear Oil Sample - Obtain 172
Transmission and Transfer Gear Breather - Clean/Replace 173
V-Belts - Inspect/Adjust/Replace 173

Every 500 Service Hours or 3 Months

Differential and Final Drive Oil Sample - Obtain .. 139
Fuel System - Prime 149
Fuel System Primary Filter - Clean/Inspect/ Replace 151
Fuel System Secondary Filter - Replace 151
Fuel Tank Cap and Strainer - Clean 152
Hydraulic System Oil Filter, Strainer and Breather - Replace/Clean 156
Hydraulic Tank Screen - Clean 158

Every 1000 Service Hours or 6 Months

Differential and Final Drive Oil - Change 137
Rollover Protective Structure (ROPS) - Inspect .. 163
Suspension Accumulator - Check 164
Torque Converter Scavenge Screen - Clean 168
Torque Converter, Transmission, and Transfer Gear Oil - Change 169
Torque Converter, Transmission, and Transfer Gear Oil Filter - Replace 170
Transmission Magnetic Screen - Clean 172

Every 2000 Service Hours

Wheel Bearings - Check/Adjust 175

Every 2000 Service Hours or 1 Year

Engine Valve Lash - Check 145
Engine Valve Rotators - Inspect 146
Fuel Injection Timing - Check 149

Hydraulic System Oil - Change 155
Suspension System - Check/Adjust 165

Every 3000 Service Hours or 2 Years

Cooling System Coolant (DEAC) - Change 130
Cooling System Coolant Extender (ELC) - Add .. 133
Cooling System Pressure Cap - Clean/Replace .. 134
Cooling System Relief Valve - Clean 134
Cooling System Water Temperature Regulator - Replace 135
Crankshaft Vibration Damper - Inspect 136

Every 3 Years

Seat Belt - Replace 164

Every 6000 Service Hours or 4 Years

Cooling System Coolant (ELC) - Change 131

i00894741

Air Conditioner - Test

SMCS Code: 7320-081

⚠ WARNING

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas can cause bodily harm or death. Do not smoke when servicing air conditioners or wherever air conditioner refrigerant gas may be present.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body.

2. Operate the engine at high idle.

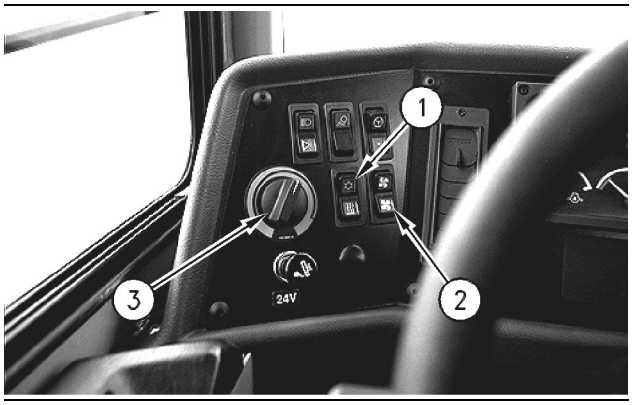

Illustration 141 g00600958

3. Press top of switch (1). Select high fan speed with fan speed switch (2). Set temperature control (3) for maximum cooling.

4. Allow the air conditioning system to run for several minutes in order to stabilize.

5. Stop the engine.

6. Raise the hood.

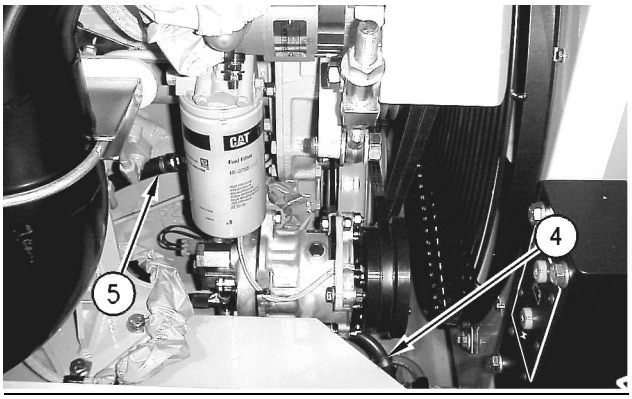

Illustration 142 g00638718

7. Feel suction hose (5) and discharge hose (4) in order to check the system for refrigerant.

If the system contains refrigerant, discharge hose (4) will be hot and suction hose (5) will be cold.

If the system contains no refrigerant or the system contains only a small amount of refrigerant, poor cooling will result.

If poor cooling is experienced, turn off the air conditioner. Stop the engine. Poor cooling indicates a low refrigerant level. Service of the air conditioner should be done by your Caterpillar dealer. For proper cooling, charge the air conditioning system with R-134a refrigerant. Refer to Service Manual, SENR5664, “Air Conditioning and Heating for R134a”.

8. Lower the hood.

Note: Operate the air conditioner monthly in order to lubricate the compressor seals. Set the controls on the maximum setting. Operate the system for 5 minutes.

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Axle Breathers - Clean/Replace

SMCS Code: 3278-070-BRE; 3278-510-BRE

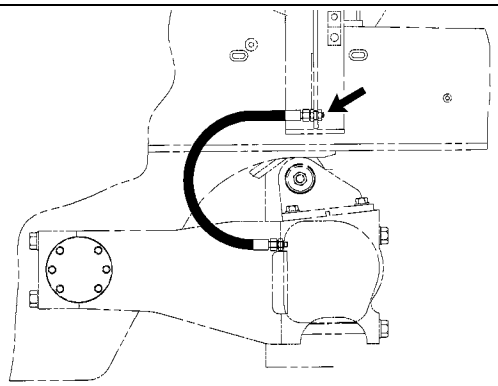


Illustration 143 g00618827

The front axle breather is mounted on the front frame.

1. Remove the front axle breather.
2. Wash the breather in a clean nonflammable solvent.
3. Shake the breather until the breather is dry.
4. Install the breather.
5. Repeat this procedure for the center axle breather and the rear axle breather.

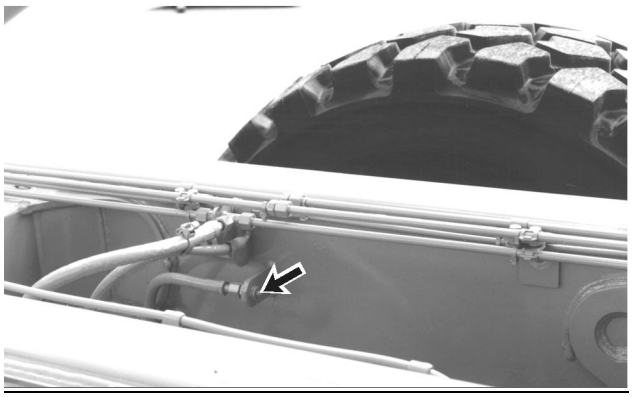


Illustration 144 g00618825

The center axle breather is mounted on the rear frame.

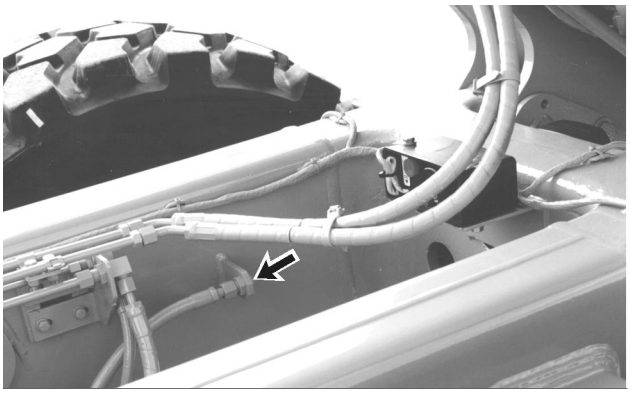


Illustration 145 g00618826

The rear axle breather is mounted on the rear frame.

If any of the axle breathers are damaged, install new breathers.

i00895005

Backup Alarm - Test

SMCS Code: 7406-081

Turn the engine start switch to the ON position in order to perform the test.

Note: Do not start the engine.

Apply the service brakes. Move the transmission speed and direction control to the REVERSE position.

The backup alarm should sound immediately. The backup alarm should continue to sound until the transmission speed and direction control is moved to the NEUTRAL position or to the FORWARD position.

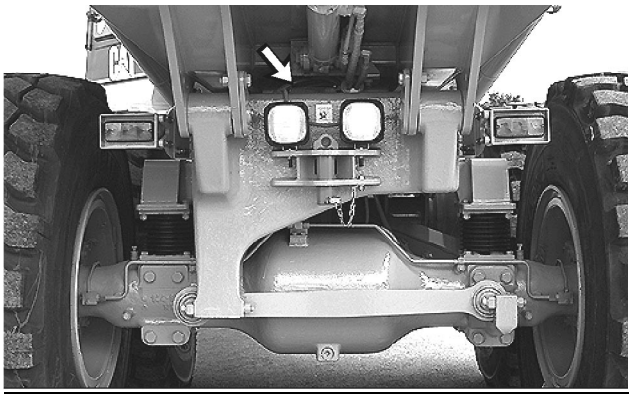


Illustration 146 g00626903

The backup alarm is on the rear of the machine.

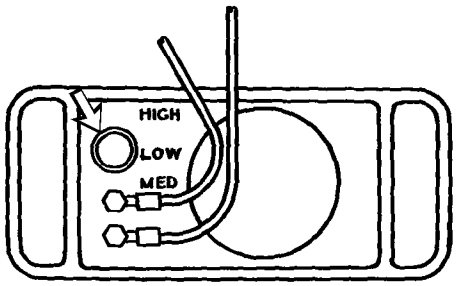


Illustration 147 g00100669

A three-position switch is located on the backup alarm. The three positions on the switch are HIGH position, LOW position and MEDIUM position. The three-position switch regulates the volume of the alarm.

The alarm is set from the factory at the highest sound level. The setting should remain on the HIGH position, unless the job site requires a lower sound level.

i01176086

Battery - Recycle

SMCS Code: 1401-561

1. Always recycle a battery. Never discard a battery.

2. Always return used batteries to one of the following locations.

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i00895045

Battery Electrolyte Level - Check

SMCS Code: 1401-535-FLV

Table 24

Battery Electrolyte Level	
Battery	**Interval**
Conventional	100 Hours
Low Maintenance	250 Hours
Maintenance Free	No Interval

A battery should not require more than 30 cc (1 oz) of water per cell per week. This should exist with the proper charging rate and with a moderate climate.

Inspect the electrolyte level in each battery cell. Maintain the electrolyte level to the bottom of the filler openings. Use distilled water. If distilled water is not available, use clean drinking water.

Note: A maintenance free battery does not require inspection.

In extreme temperatures, check the water in the cells weekly.

All batteries must have the following maintenance at every 250 hours.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Illustration 148 g00602831

2. The batteries are located under panels at either side of the engine hood.

3. Remove the two panels.

4. Check the battery retainers. Tighten the battery retainers.

5. Clean the top of the batteries with a clean towel. Do not allow dirt to build up on the battery. Conductive paths may develop. Under dusty conditions, clean the tops of the batteries often.

Buildup of dirt may lead to the following electrical problems:

- Electrical charge may be drained from the batteries.
- The Engine Monitoring System may function with the disconnect switch in the OFF position.

6. Lift the post covers in order to remove the cable from the battery terminal. Clean the battery terminals. A fine grade of sandpaper may be used for cleaning.

7. Petroleum jelly may be used as protection against corrosion. Apply corrosion inhibitors after you connect the cables to the battery post.

8. Install the cables.

9. Position the post covers.

10. Install the two panels.

i01183182

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 1411-510

1. Turn the engine start switch to the OFF position. Turn all switches to the OFF position.

2. Turn the battery disconnect switch to the OFF position. Remove the key.

3. At the battery disconnect switch, disconnect the negative battery cable that is connected to the frame.

Note: Do not allow the disconnected battery cable to contact the disconnect switch.

4. Disconnect the negative battery cable from the terminals of the battery.

5. Perform the necessary repairs. Replace the cable or the battery, as needed.

6. Connect the negative battery cable to the terminals of the battery.

7. Connect the negative battery cable at the battery disconnect switch.

8. Install the key for the battery disconnect switch. Turn the key to the ON position.

i00895047

Body Pivot Bearings - Lubricate

SMCS Code: 7258-086-BD; 7424-086

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Wipe all the grease fittings before you apply lubricant.

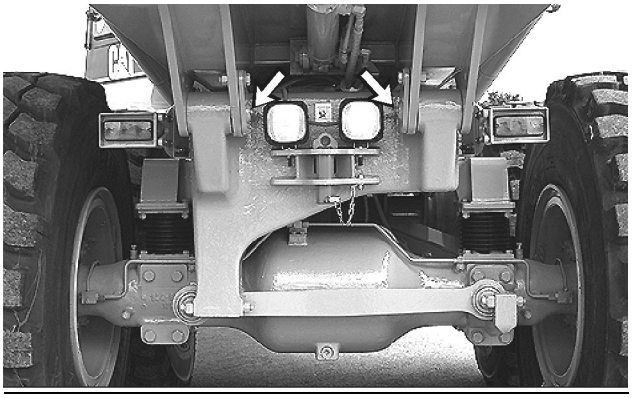


Illustration 149 g00603194

Apply lubricant to the grease fittings for the pivot bearings. There is a total of two grease fittings. One grease fitting on the end of each pivot pin.

i00895052

Brake Pads - Check

SMCS Code: 4251-535; 4267-535; 4273-535

The brakes on this machine are self-adjusting. Visually inspect the brake pads and replace worn brake pads, if necessary.

When new brake pads are installed, record the measurement at each inspection hole in the brake caliper. Record the axle as the location of the inspection hole changes with the axle. These records can be used as a comparison for future measurements.

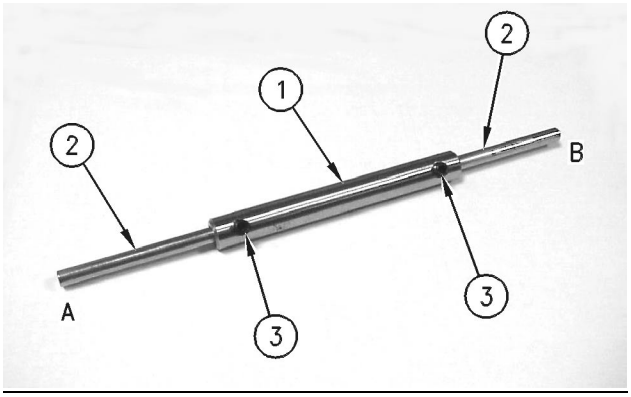


Illustration 150 g00646109

Typical Brake Wear Measurement Gauge

(1) Handle
(2) Steel Rod
(3) Socket Setscrew

If a measuring tool is available the following steps should be taken in order to record measurements when new brake pads are installed.

1. Park the machine on hard level ground and apply the parking brake.

2. Lower the suspension.

Refer to Operation and Maintenance, “Suspension System - Check/Adjust”.

3. Stop the engine.

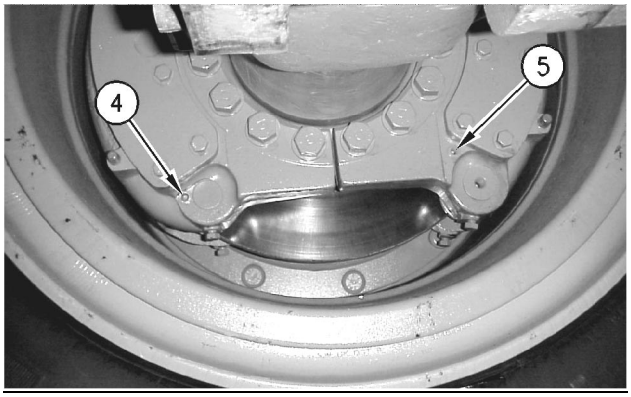


Illustration 151 g00646115

4. There are two inspection holes on each brake caliper. Plastic plugs are installed in the two inspection holes on both sides of each brake caliper. Illustration 151 shows the location of the bottom two holes (4) and (5) on the right side brake calipers on the front axle.

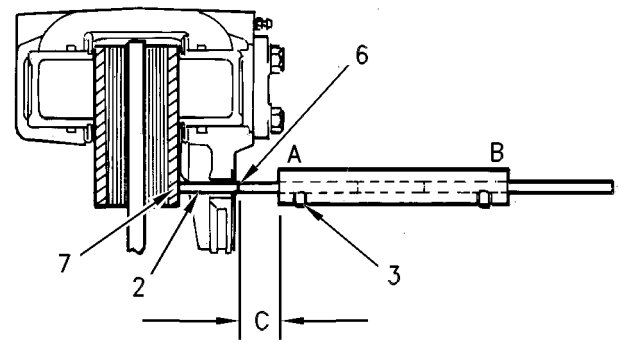


Illustration 152 g00645509

5. Remove plastic plugs from both sides of inspection holes (4) and (5). Apply the service brakes. Seek the assistance of a capable operator in order to apply the service brakes while you record the measurements. Insert the end “A” of the brake wear measurement gauge in inspection hole (4). Mark position (6) on steel rod (2) with a pencil. Remove the brake wear measurement gauge from the inspection hole. Loosen socket setscrew (3) in the handle of the brake wear measurement gauge. Extend steel rod (2) 14 mm (0.55 inch) beyond the handle. Tighten the socket setscrew in the handle of the brake wear measurement gauge. Record the measurement (C). Record the axle and the location of the inspection hole. Rotate the brake wear measurement gauge and insert end “B” of the brake wear measurement gauge in inspection hole (5). Repeat the previous procedure at inspection hole (5).

Note: The steel rod on the brake wear measurement gauge must be in contact with the brake pads when the measurements are taken.

6. It is necessary to record the measurement at both inspection holes (4) and (5) as the measurement will differ due to the position of the inspection holes in the brake calipers. The measurement (C) at the inspection holes can differ if the brake disc plate has been skimmed. The measurement at the inspection holes can also be affected if the brake pads are worn or the brake disc plates are distorted. Repeat this procedure at each inspection hole on each axle. Release the service brakes.

The following steps should be taken in order to check the wear on brake pads.

1. Apply the service brakes. Seek the assistance of a capable operator in order to apply the service brakes while you check the brake pads. Set the measuring tool to suit the appropriate inspection hole in the brake calipers. Refer to your records.

2. Insert the steel rod of the measuring tool in the inspection hole in the brake caliper. Check if the steel rod in the measuring tool is touching the brake pads. When the measurement (C) is reduced to 5 mm (0.2 inch), the service life of the brake pads are nearing the maximum wear. If the handle of the measuring tool touches the brake caliper before the steel rod touches brake pads (7). The brake pads are at the maximum wear. Check the measurement through both inspection holes in the brake caliper as the brake pads can give uneven wear. Release the service brakes.

A steel rod can be used in order to check the brake pads for wear if a measuring tool is not available. The steel rod should measure 5 mm (0.2 inch) diameter and 100 mm (4 inch) long. When a steel rod is used to check the brake pads for wear, the following steps should be taken.

1. Apply the service brakes. Seek the assistance of a capable operator in order to apply the service brakes while you check the brake pads. Insert the steel rod in inspection hole (5). Measure the distance from the face of the brake caliper to the brake pads. Mark position (6) on the steel rod with a pencil. Remove the steel rod from the inspection hole. When all the components are new, the measurement should be approximately 70 mm (2.8 inch). Repeat the procedure at inspection hole (4). When all the components are new, the measurement should be approximately 50 mm (2 inch). When the measurements have increased by 14 mm (0.6 inch), the brake pads are nearing the maximum wear. Check the measurement at both inspection holes in the brake caliper as the brake pads can give uneven wear.

Note: The steel rod must be in contact with the brake pads when the measurements are taken.

2. The measurement at the inspection holes can differ if the brake disc plate has been skimmed. The measurement at the inspection holes can also be affected if the brake pads are worn or the brake disc plates are distorted. Repeat this procedure at each inspection hole on each axle. Release the service brakes.

Remove the brake pads from the brake calipers for closer inspection. Measure the thickness of the friction material and carrier at both ends of the brake pads. Minimum thickness of the friction material is 11 mm (0.4 inch). Replace the brake pads if the friction material is worn to these figures. Install the brake pads.

Press the service brake control. Observe that the brake pads move freely away from the brake caliper. Release the service brake control. Observe that the brake pads move freely away from the brake disc. If there is not enough free play between the brake pads and the brake caliper, the service brakes may not release completely. Investigate the cause. Replace any worn out parts.

Repeat the procedure for each wheel brake.

Install the plastic plugs on all of the brake calipers.

Start the engine.

Raise the suspension.

Refer to Operation and Maintenance, “Suspension System - Check/Adjust”.

i01252522

Brakes, Indicators and Gauges - Test

SMCS Code: 4251-081; 4267-081; 7000; 7450-081; 7490-081

Before you operate the machine, perform the following checks and make any necessary repairs.

- Look for broken lenses on the gauges, broken indicator lights, broken switches, and other broken components in the cab.
- Start the engine.
- Look for inoperative gauges.
- Turn on all machine lights. Check for proper operation.
- Sound the forward horn.
- Start the engine.
- Move the machine forward and test the service brakes. Refer to Operation and Maintenance Manual, “Braking System-Test”.
- Stop the engine.

i01611717

Braking System - Test

SMCS Code: 3077-081; 4251-081; 4267-081

Service Brake Holding Ability Test

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move during test, reduce the engine speed immediately and engage the parking brake.

Make sure that the area around the machine is clear of personnel and clear of obstacles.

Test the service brake on a dry, level surface.

Fasten your seat belt before you test the service brake.

The service brake holding ability test determines whether the service brake is functional. This test is not intended to measure the maximum brake holding effort.

The brake holding effort that is required to hold a machine at a specific engine rpm will be different for various machines. This is due to the following variances:

- engine setting
- engine power
- engine efficiency
- brake holding ability

When the machine begins to move, the engine rpm should be compared to a previous test. Use the comparison as an indication of system deterioration.

1. Before you test the service brake, apply the parking brake. Move the transmission control to the NEUTRAL position. Start the engine. Allow the engine to fully charge the brake system.
2. Apply the service brake. Move the transmission control to the FIRST SPEED FORWARD position. Release the parking brake.
3. Gradually increase the engine rpm. The service brake should prevent the machine from moving away when the engine is running at 1700 rpm.
4. If the machine moves, reduce the engine speed immediately and apply the parking brake. Move the transmission control to the NEUTRAL position. Machine movement indicates that the service brake system requires service.

The engine rpm should be 1700 rpm or more when the test is carried out. For future comparisons, record the actual engine rpm that is achieved during the test.

NOTICE

If the machine moved while testing the service brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the service brakes before returning the machine to operation.

Parking Brake Check

The test for the parking brake must be carried out with the rated load in the body.

Test the service brakes and the secondary steering system on level ground before you carry out this procedure.

1. Drive the machine onto an incline of 15%. The machine must be pointing down the incline.
2. Engage the service brakes in order to stop the machine on the incline. The area around the machine must be clear of personnel and obstacles.
3. Move the parking brake control to the ENGAGED position. Move the transmission control to the N position.
4. Shut off the engine.
5. Gradually disengage the service brakes.
6. If the machine moves forward, engage the service brakes immediately. Start the engine. Disengage the parking brake and drive the machine onto level ground. Shut off the engine.

If the machine moved during the test, the parking brake requires service.

NOTICE

If the machine moved while testing the parking brake, inspect the parking brake components for wear or damage. Repair or replace the worn or damaged parking brake components as required before returning the machine to service.

i00908801

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

NOTICE

An air filter element plugged with dust will result in decreased performance and service life to the air conditioner or cab heater (if equipped).

To prevent decreased performance, clean the air filter element, as required.

Both cab air filter elements must be serviced at regular intervals. Operating conditions will influence the service interval for the cab air filter elements. Inspect the cab air filter elements more often in very dusty conditions. Both cab air filter elements are located in the side wall of the cab forward of the cab door.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

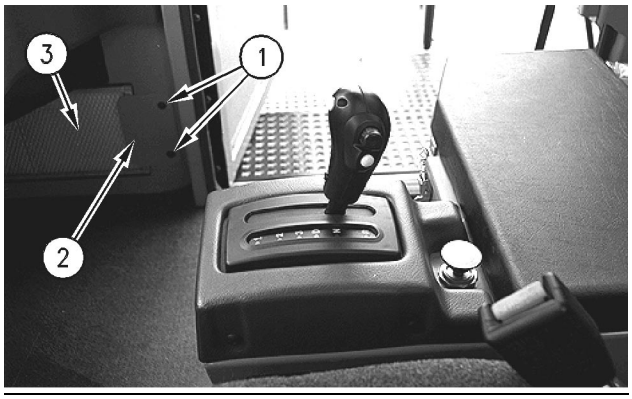


Illustration 153 g00603195

2. Remove two screws (1) and retainer (2) in order to allow removal of the internal filter element (3).

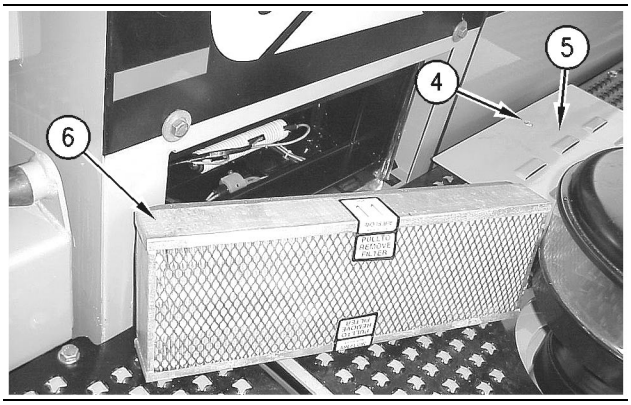


Illustration 154 g00613944

3. Loosen latch (4) and lift off door (5) in order to allow removal of the external filter element (6).

4. Remove the two filter elements (3) and (6) for inspection.

5. Clean the inside of both cab air filter housings.

6. Inspect each filter element. If the pleats or the seals are damaged discard the filter element. Replace a damaged filter element with a new filter element.

7. If the filter element is not damaged, clean the filter element by using pressure air. The maximum air pressure for cleaning is 205 kPa (30 psi).

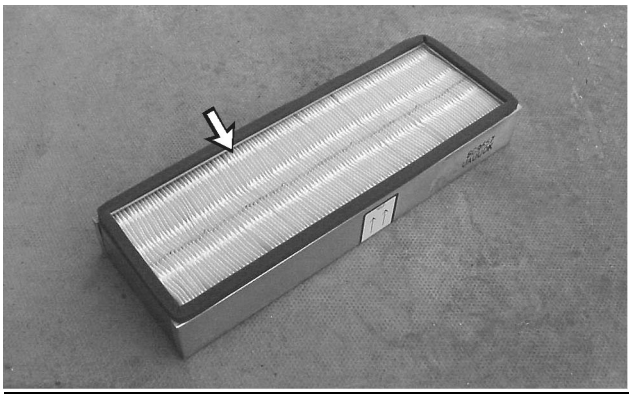


Illustration 155 g00613945

8. When you clean the inside pleats and the outside pleats, direct air along the pleats. Do not position the air nozzle closer than 160 mm (6 inch) from the filter element. The filter elements may be washed with warm water and nonsudsing household detergent. Rinse the filter element in clean water and air dry the filter thoroughly.

9. Install the two filter elements (3) and (6) with cleaned filter elements or new filter elements.

10. Replace retainer (2) and two screws (1) in order to secure the internal filter element.

11. Replace door (5) and tighten latch (4) in order to secure the external filter element.

12. Replace both filter elements if the filter elements have been in service for one year.

i00908850

Circuit Breakers - Reset

SMCS Code: 1420-529

The circuit breaker panel is located in the operator compartment. The circuit breaker panel also contains fuses.

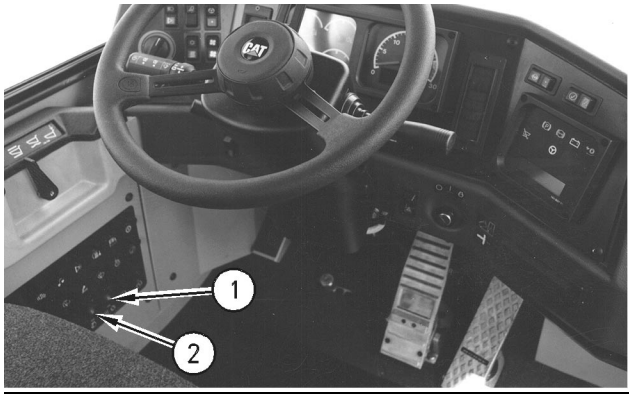


Illustration 156 g00611419

The circuit breakers protect the electrical system from damage.

Reset the circuit breaker if the circuit breaker trips. Push in the button in order to reset the circuit breaker. If the electrical system is working properly, the button will remain depressed. If the button does not remain depressed and the circuit breaker trips soon after being reset, check the appropriate electrical circuit. Repair the electrical circuit, if necessary.

Headlamps – 15 amp

The circuit breaker for the headlamp is located behind the panel. The circuit breaker resets automatically when the fault is corrected.

Heater/Air Conditioner (1) – 15 amp

Start Switch (2) – 10 amp

Circuit Breakers for the Alternator and for the Battery

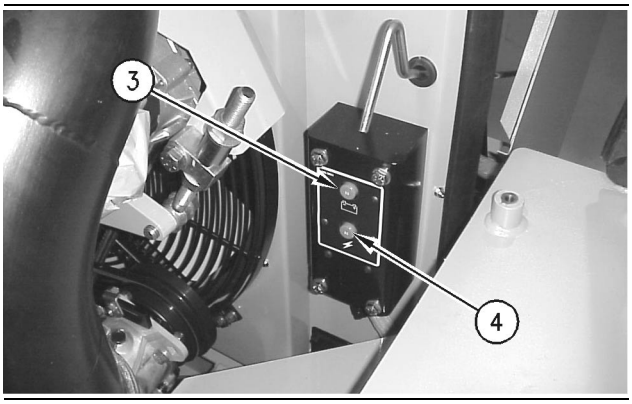


Illustration 157 g00655109

The circuit breakers for the alternator and for the battery are located under the engine hood on the front right side of the engine compartment. Circuit breaker (3) for the battery protects the battery from a dead short. Circuit breaker (4) for the alternator protects the alternator from a power surge. Reset the circuit breaker if the breaker trips. Push in the button in order to reset the circuit. If the button does not remain depressed and the circuit breaker trips soon after being reset, check the appropriate electrical circuit. Repair the electrical circuit, if necessary.

Battery (3)

Alternator (4)

i00909423

Cooling System Coolant (DEAC) - Change

SMCS Code: 1350-044

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

NOTICE
Do not change the coolant until you read and understand the material found in the Operation and Maintenance Manual, “Cooling System Specifications” section. Failure to do so could result in damage to the cooling systems components.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

If the Diesel Engine Antifreeze/Coolant (DEAC) is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body.

1. Stop the engine and allow the engine to cool.
2. Remove the radiator grill. The grill is secured to the hood with four bolts and washers. Raise the hood.

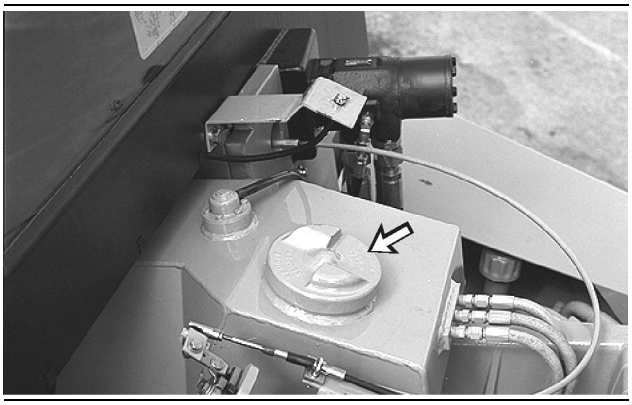


Illustration 158 g00606333

3. Slowly remove the cooling system pressure cap in order to relieve pressure.

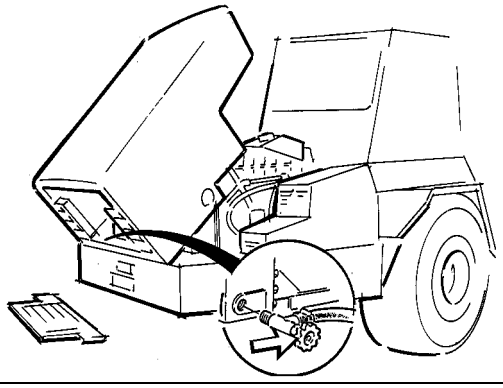


Illustration 159 g00606334

4. Open the drain valve. The drain valve is located at the base of the radiator. Allow the coolant to drain into a suitable container.
5. Close the drain valve. Fill the cooling system with clean water and with a 6 to 10% concentration of cooling system cleaner.
6. Start the engine. Run the engine for 90 minutes.
7. Stop the engine. Open the drain valve and drain the cleaning solution into a suitable container.
8. Flush the cooling system with water until the draining water is transparent.
9. Close the drain valve.

10. Add the coolant solution. Refer to Operation and Maintenance Manual, “Refill Capacities”.

Note: Make sure that the cooling system pressure cap remains off during Step 11 and Step 12.

11. Start the engine and run the engine. Leave the pressure cap off until the water temperature regulator opens and until the coolant level stabilizes.

12. Maintain the coolant level at approximately 13 mm (0.5 inch) from the bottom of the filler pipe.

13. Inspect the gasket of the cooling system pressure cap for damage. If the gasket is damaged, replace the gasket.

14. Install the cooling system pressure cap.

15. Stop the engine.

16. Lower the hood. Install the radiator grill. Secure the radiator grill with four bolts and four washers.

i00910228

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044-NL

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

NOTICE
Do not change the coolant until you read and understand the material found in the Operation and Maintenance Manual, “Cooling System Specifications” section. Failure to do so could result in damage to the cooling systems components.

NOTICE
Mixing Extended Life Coolant (ELC) with other products reduces the effectiveness of the coolant and shortens coolant life. Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specifications for premixed or concentrate coolants. Use only Caterpillar Extender with Caterpillar ELC. Failure to follow these recommendations could result in the damage to cooling systems components.

If ELC cooling system contamination occurs, refer to Operation and Maintenance, “Extended Life Coolant (ELC)” under the topic ELC Cooling System Contamination.

This machine was factory filled with Extended Life Coolant.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

If the coolant in the machine is being changed to Extended Life Coolant from another type of coolant, Refer to Operation and Maintenance Manual, “Extended Life Coolant (ELC) Cooling System Maintenance”.

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body.

1. Stop the engine and allow the engine to cool.

2. Remove the radiator grill. The radiator grill is secured with four bolts. Raise the hood.

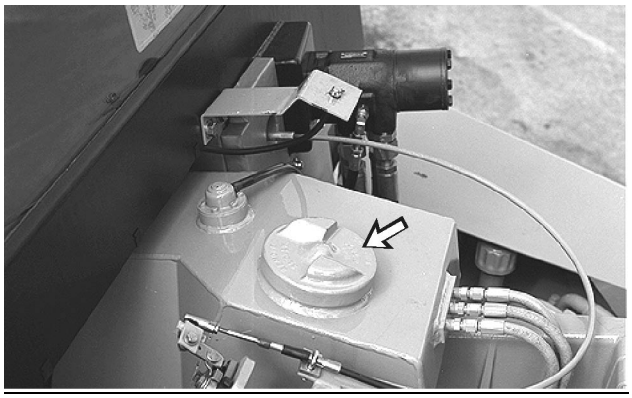


Illustration 160 g00606337

3. Slowly remove the cooling system pressure cap in order to relieve pressure.

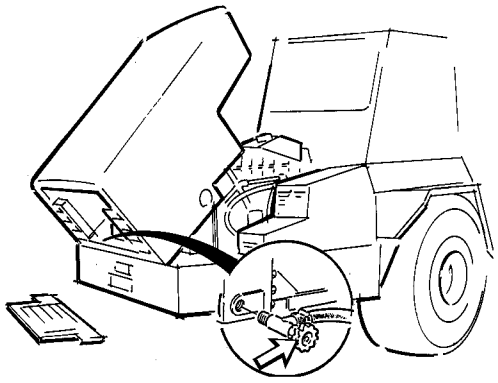


Illustration 161 g00606338

4. Open the drain valve. The drain valve is located at the base of the radiator. Allow the coolant to drain into a suitable container.

5. Flush the cooling system with clean water until the draining water is transparent.

6. Close the drain valve.

7. Add the Extended Life Coolant. Refer to Operation and Maintenance Manual, “Refill Capacities”.

Note: Make sure that the cooling system pressure cap remains off during Step 8 and Step 9.

8. Start the engine. Run the engine until the water temperature regulator opens and the coolant level stabilizes.

9. Maintain the coolant level at approximately 13 mm (0.5 inch) from the bottom of the filler pipe.

10. Inspect the gasket of the cooling system pressure cap for damage. If the gasket is damaged, replace the gasket.

11. Install the cooling system pressure cap.

12. Stop the engine.

13. Lower the hood. Install the radiator grill. Secure the radiator grill with four bolts and four washers.

i01107417

Cooling System Coolant Additive (DEAC) - Add

SMCS Code: 1352-544

See the appropriate topics in your machine’s Operation and Maintenance Manual for all cooling system requirements.

Use 8T-5296 Test Group to check the concentration of the Diesel Engine Antifreeze/Coolant (DEAC).

If necessary, add supplemental coolant additive.

NOTICE

Do not exceed the recommended six percent supplemental coolant additive concentration. Excessive supplemental coolant additive concentration can form deposits on the higher temperature surfaces of the cooling system, reducing the engine’s heat heat transfer characteristics. Reduced heat transfer could cause cracking of the cylinder head and other high temperature components. Excessive supplemental coolant additive concentration could also result in radiator tube blockage, overheating, and/or accelerated water pump seal wear. Never use both liquid supplemental coolant additive and the spin-on element (if equipped) at the same time. The use of those additives together could result in supplemental coolant additive concentration exceeding the recommended six percent maximum.

⚠ WARNING

Steam or hot coolant can cause severe burns.

Do not loosen the filler cap or the pressure cap on a hot engine.

Allow the engine to cool before removing the filler cap or the pressure cap.

1. Slowly loosen the cooling system pressure cap in order to relieve the pressure. Remove the cooling system pressure cap.

2. Add supplemental coolant additive. Drain some coolant from the radiator into a suitable container in order to allow space for the extra coolant additive.

Note: Always discard drained fluids according to local regulations.

3. Add 0.24 L (.50 pint) of supplemental coolant additive for every 38 L (10 US gal) of engine cooling capacity.

4. Inspect the gasket for the cooling system pressure cap. Replace the gasket if the gasket is damaged.

5. Install the cooling system pressure cap.

i01338813

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-544-NL

When a Caterpillar Extended Life Coolant (ELC) is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 25

Cooling System Capacity	Recommended Amount of Caterpillar Extender
22 to 30 L (6 to 8 US gal)	0.57 L (20 oz)
30 to 38 L (8 to 10 US gal)	0.71 L (24 oz)
38 to 49 L (10 to 13 US gal)	0.95 L (32 oz)
49 to 64 L (13 to 17 US gal)	1.18 L (40 oz)
64 to 83 L (17 to 22 US gal)	1.60 L (54 oz)
83 to 114 L (22 to 30 US gal)	2.15 L (72 oz)
114 to 163 L (30 to 43 US gal)	3.00 L (100 oz)
163 to 242 L (43 to 64 US gal)	4.40 L (148 oz)

For additional information about adding an extender, see Operation and Maintenance Manual, “Caterpillar Extended Life Coolant (ELC)” or consult your Caterpillar Dealer.

i00910789

Cooling System Level - Check

SMCS Code: 1350-535-FLV

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

2. Raise the hood.

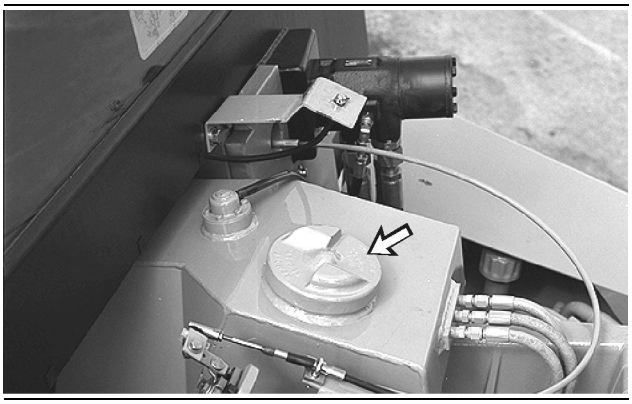


Illustration 162 g00605631

3. Remove the cooling system pressure cap slowly in order to relieve the pressure.

4. Maintain the coolant level at 13 mm (0.5 inch) from the bottom of the filler cap opening. If it is necessary to add coolant daily, check the system for leaks.

5. Install the cooling system pressure cap.

6. Lower the hood.

i00910857

Cooling System Pressure Cap - Clean/Replace

SMCS Code: 1382-070; 1382-510

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.
2. Raise the hood.

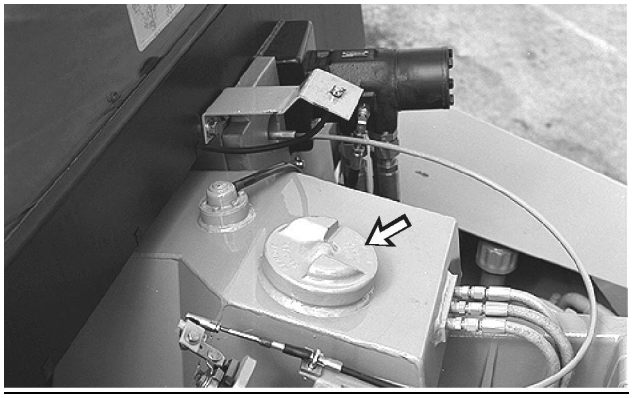


Illustration 163 g00605633

3. Remove the cooling system pressure cap slowly in order to relieve the pressure.
4. Inspect the cooling system pressure cap for damage, for foreign material, and for deposits.
5. Clean the cooling system pressure cap with a clean cloth. If necessary, replace the cap.
6. Inspect the condition of the gasket in the cooling system pressure cap. Replace the gasket, if necessary.
7. Install the cooling system pressure cap.
8. Lower the hood.

i00910883

Cooling System Relief Valve - Clean

SMCS Code: 1370-070

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.
2. Raise the hood.

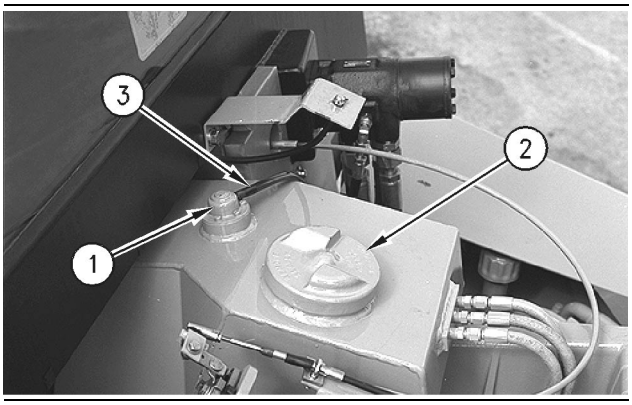


Illustration 164 g00601477

3. The cooling system relief valve (1) is located on the top of the expansion tank.
4. Remove cooling system pressure cap (2) slowly in order to relieve the pressure.
5. Remove overflow pipe (3).

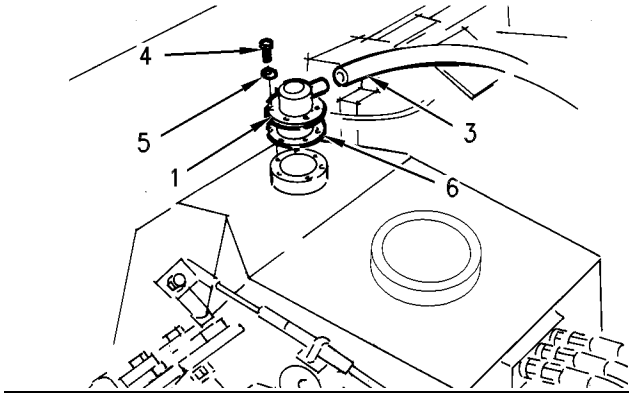


Illustration 165 g00601489

6. Remove mounting screws (4), washers (5), gasket (6) and relief valve (1).

7. Inspect relief valve (1) and gasket (6).

8. Inspect the components for damage and for foreign matter. Replace the relief valve if the valve assembly is damaged.

9. Install relief valve (1), gasket (6), mounting screws (4) and washers (5). Install overflow pipe (3).

10. Maintain the coolant level within 13 mm (.5 inch) of the bottom of the filler pipe.

11. Install the cooling system pressure cap.

12. Lower the hood.

i00338284

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove filler cap slowly to relieve pressure only when engine is stopped and radiator cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Conditioner contains alkali. Avoid contact with skin and eyes.

Replace the cooling system water temperature regulator on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system.

The water temperature regulator should be replaced after the cooling system has been cleaned. Replace the water temperature regulator while the cooling system is completely drained or while the cooling system coolant is drained to a level that is below the water temperature regulator housing assembly.

NOTICE
Failure to replace the engine's water temperature regulator on a regularly scheduled basis could cause severe engine damage.

Note: If you are only replacing the water temperature regulator, drain the cooling system coolant to a level that is below the water temperature regulator housing assembly.

1. Loosen the hose clamp and remove the hose from the elbow.

2. Remove the bolts from the elbow and remove the elbow.

3. Remove the turbocharger water line from the cover assembly.

4. Remove the bolts from the the water temperature regulator housing and remove the water temperature regulator housing.

5. Remove the water temperature regulator from the water temperature regulator housing. Remove the gasket from the water temperature regulator housing. Remove the seal from the water temperature regulator housing.

NOTICE
Former water temperature regulators may be used, if they meet test specifications and are not damaged or have excessive buildup or deposits.

NOTICE
Since Caterpillar engines incorporate a shunt design cooling system, it is mandatory to always operate the engine with a water temperature regulator.

Depending on load, failure to operate with a water temperature regulator could result in either an overheating or an overcooling condition.

NOTICE
If the water temperature regulator is installed incorrectly, it will cause the engine to overheat.

6. Install a new seal in the water temperature regulator housing. Install a new water temperature regulator and a new gasket. Install the water temperature regulator. Install the water temperature housing.

7. Install the elbow and the hose. Tighten the hose clamp.

8. Add the cooling system coolant. Maintain the coolant level within 13 mm (.50 inch) of the bottom of the filler tube.

i00913422

Crankshaft Vibration Damper - Inspect

SMCS Code: 1205-040

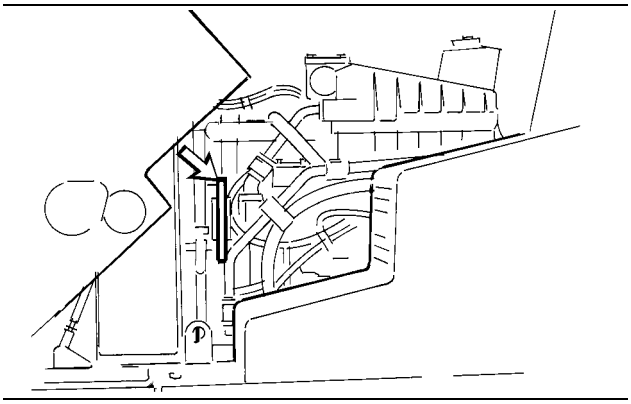


Illustration 166 g00601492

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Damage to the vibration damper or failure of the vibration damper will increase torsional vibrations. These vibrations will result in damage to the crankshaft and other engine components. A deteriorating vibration damper will cause excessive gear train noise at variable points in the speed range.

Caterpillar recommends replacing the vibration damper for any of the following reasons.

- The engine has had a failure because of a broken crankshaft.
- The S·O·S analysis detected a worn crankshaft front bearing.
- The S·O·S analysis detected a large amount of gear train wear that is not caused by a lack of oil.

The vibration damper can be used again if none of the above conditions are found or if the damper is not damaged.

Refer to the Service Manual, SENR9125, “Engine Disassembly and Assembly”, “Crankshaft Vibration Damper and Pulley - Remove and Install” in order to replace the vibration damper.

i00913481

Differential and Final Drive Oil - Change

SMCS Code: 3258-044; 4050-044

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Operate the machine until the oil in the differential is warm.

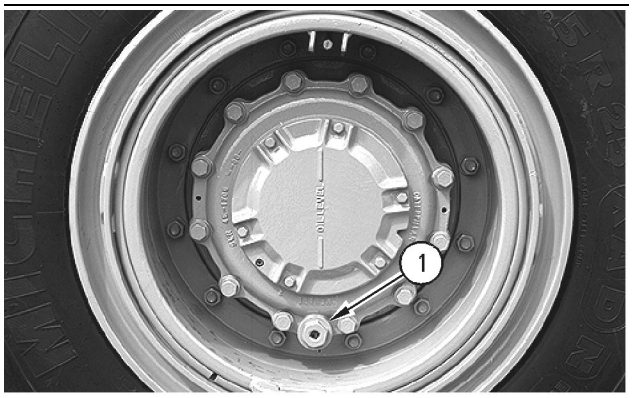


Illustration 167 g00600965

2. Park the machine on level ground. Slowly move the machine until drain plug (1) is at the lowest point on one of the final drives. Ensure that the parking brake is fully engaged. Stop the engine.

3. Wipe the area around drain plug (1) on the final drive before you remove the plug. Remove drain plug (1). Allow the oil to drain into a suitable container.

4. Clean the final drive drain plug and inspect the O-ring seal for damage. Lubricate the O-ring seal with gear oil and install the plug.

Note: The plug is magnetic. Check the plug for ferrous particles that may indicate wear of the differential and final drive components.

5. Start the engine and release the parking brake.

6. Repeat Step 2 through Step 4 for the remaining final drives.

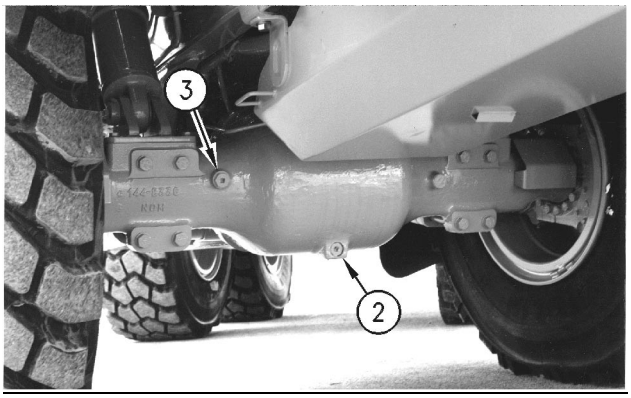


Illustration 168 g00600967

7. Remove differential drain plug (2) from the front axle, and allow the oil to drain into a suitable container.

8. Clean the differential drain plug and inspect the O-ring seal for damage. Lubricate the O-ring seal with gear oil and install the plug.

Note: The plug is magnetic. Check the plug for ferrous particles that may indicate wear of the differential and final drive components.

9. Start the engine.

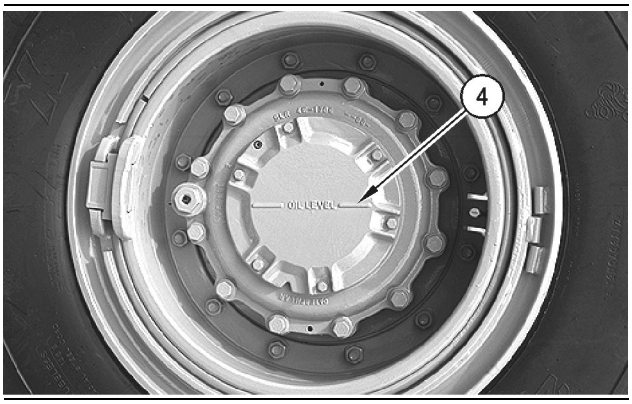


Illustration 169 g00601012

10. Slowly move the machine until “Oil Level” mark (4) on the front right final drive is horizontal. Ensure that the parking brake is fully engaged. Stop the engine.

11. Add oil to the final drive through plug hole (1) on the final drive. Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”. Maintain the oil level to the bottom of the plug hole. If necessary, add more oil. Allow the oil to flow along the axle housing and settle at a common level.

12. The speed of filling can be increased by removing axle housing plug (3). Add oil through the plug hole in the axle housing. Add oil until the oil drips from the plug hole.

13. Clean plug (1) and install the plug to the front right side final drive.

14. Start the engine.

15. Repeat Step **10** through Step **14** for the front left final drive.

16. Operate the machine for a few minutes. Slowly move the machine until "Oil Level" mark (4) on the front right final drive is horizontal. Ensure that the parking brake is fully engaged. Stop the engine. Check the oil level at axle housing plug (3). Repeat for the front left side final drive.

17. Repeat the procedure in order to change the oil in the center axle and the rear axle.

18. Repeat Step **16** for the center final drives.

19. Repeat Step **16** for the rear final drives.

i00931005

Differential and Final Drive Oil Level - Check

SMCS Code: 3258-535-FLV; 4050-535-FLV

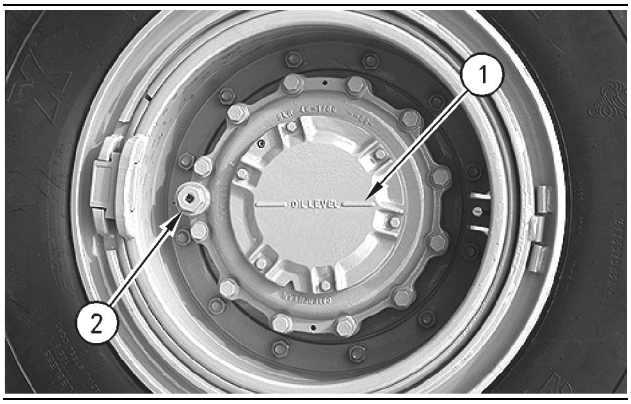


Illustration 170 g00600181

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

1. Park the machine on level ground. Slowly move the machine until "Oil Level" mark (1) on the front right final drive is horizontal. Ensure that the parking brake is fully engaged. Stop the engine.

2. Wipe the area around plug (2) on the final drive before you remove the plug.

3. Add oil to the axle via the plug hole on the final drive. Maintain the oil level to the bottom of the plug hole. If necessary, add more oil. Allow the oil to flow along the axle housing and settle at a common level.

4. Clean the plug and install the plug.

Note: The plug is magnetic. Check the plug for ferrous particles that may indicate wear of the differential and final drive components.

5. Start the engine.

6. Repeat the procedure for the front left final drive.

7. Repeat Step **1** through Step **6** in order to check the oil level of the center axle differential and final drives. Repeat Step **1** through Step **6** in order to check the oil level of the rear axle differential and final drives.

i00931022

Differential and Final Drive Oil Sample - Obtain

SMCS Code: 3258-008; 4050-008; 7542-008

Refer to the Operation and Maintenance Manual, “S·O·S Oil Analysis”.

Note: Use a sampling gun for obtaining the oil samples.

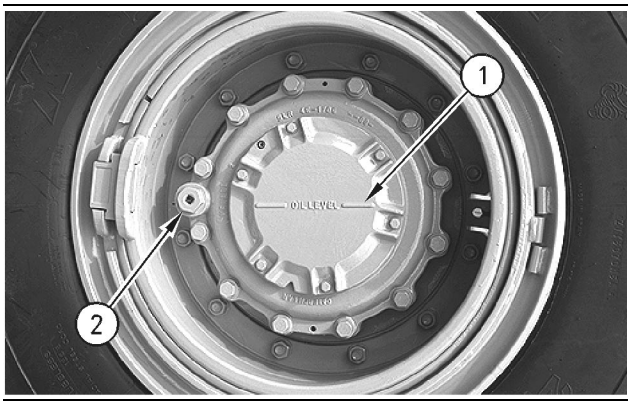


Illustration 171 g00600181

1. Park the machine on level ground. Slowly move the machine until “Oil Level” mark (1) on the front right final drive is horizontal. Ensure that the parking brake is fully engaged. Stop the engine.

2. Wipe the area around plug (2) on the final drive before you remove the plug.

3. Obtain an oil sample through the plug hole in the final drive.

4. Clean the plug and inspect the O-ring seal for damage. Lubricate the O-ring seal with gear oil and install the plug.

Note: The plug is magnetic. Check the plug for ferrous particles that may indicate wear of the differential and final drive components.

5. Start the engine.

6. Repeat Steps 1 through 4 for the front left final drive.

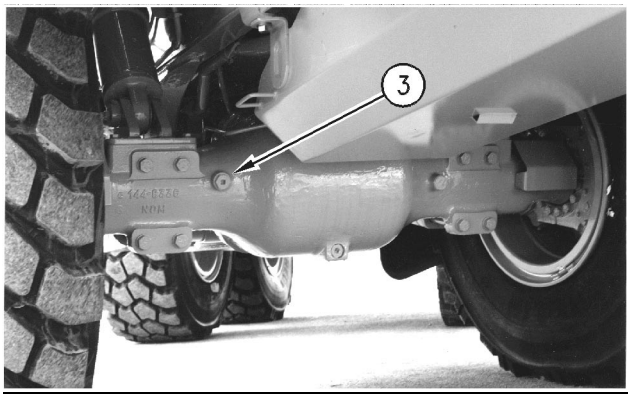


Illustration 172 g00600216

7. Wipe the area around plug (3) on the front axle housing before you remove the plug. Obtain an oil sample through the plug hole in the front axle housing.

8. Clean the plug and inspect the O-ring seal for damage. Lubricate the O-ring seal with gear oil and install the plug.

Note: The plug is magnetic. Check the plug for ferrous particles that may indicate wear of the differential and final drive components.

9. Start the engine.

10. Repeat this procedure in order to obtain oil samples for the remaining axles.

i00931351

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070-PY; 1054-510-PY

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

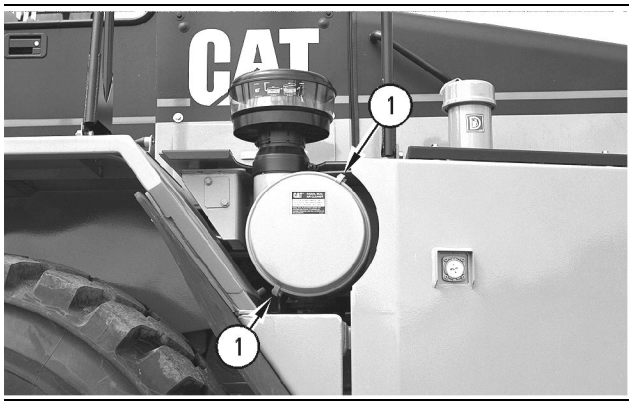


Illustration 173 g00600244

1. Release clips (1) in order to remove the air cleaner cover.

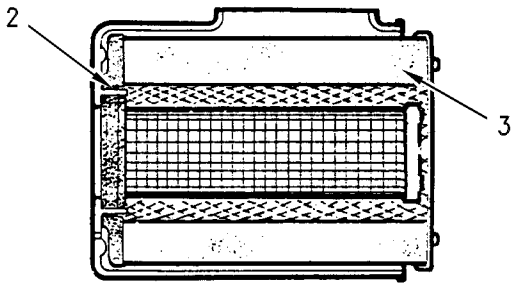


Illustration 174 g00600252

2. The primary element is a tight fit on the air cleaner housing. Carefully release primary element seal (2) by rocking the primary element, or by twisting the primary element. Remove primary element (3) from the air cleaner housing. Avoid touching the air filter primary element against the sides of the air cleaner housing. Touching the air filter primary element against the sides of the air cleaner housing can dislodge dust.

3. Clean the inside of the air cleaner housing.

Note: Do not clean the primary element by bumping or by taping the element.

4. Inspect the primary element. If the pleats, the gaskets, or the seals are damaged, discard the primary element. Replace a damaged primary element with a clean primary element.

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

5. If the primary element is not damaged, clean the primary element.

The primary element can be cleaned by using pressurized air.

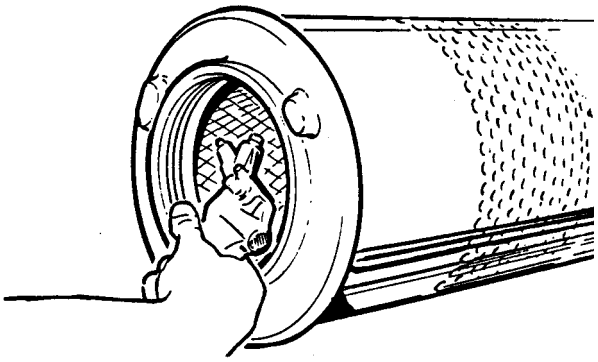


Illustration 175 g00600268

6. When you clean the inside pleats and the outside pleats, direct the air along the pleats.

7. Inspect the primary element after cleaning. Do not use a primary element if the pleats, the gaskets, or the seals are damaged.

8. Cover the clean primary element and store the primary element in a clean, dry location.

A primary element may be cleaned for a maximum of six times. Also, replace the primary element after one year of service.

9. Install a clean primary element.

10. Clean the air cleaner cover and install the air cleaner cover. Fasten the retaining clips.

11. Reset the engine air filter service indicator.

12. Start the engine. If the red portion of the piston is showing in the engine air filter service indicator, install a new secondary element. Also, if the exhaust smoke is black, install a new secondary element.

Refer to the Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace”.

i00931374

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510-SE

NOTICE
Always replace the secondary element. Do not attempt to reuse it by cleaning. Engine damage could result.

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

Note: Replace the engine air filter secondary element when you service the engine air filter primary element for the third time. If a clean primary element has been installed and the window of the engine air filter service indicator is red, replace the secondary element. Also if the exhaust smoke remains black and a clean primary element has been installed, replace the secondary element.

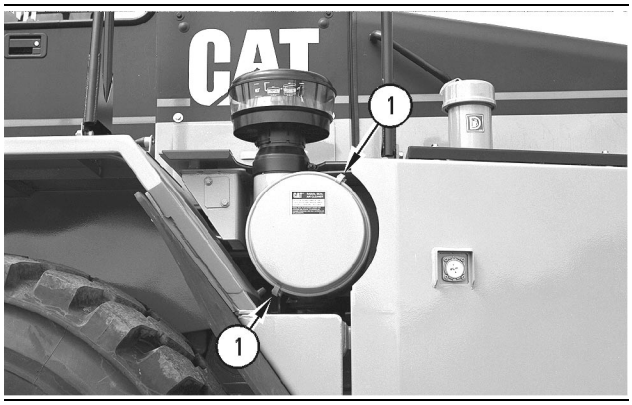


Illustration 176 g00600244

1. Release retaining clips (1).
2. Remove the air cleaner cover and the primary element.

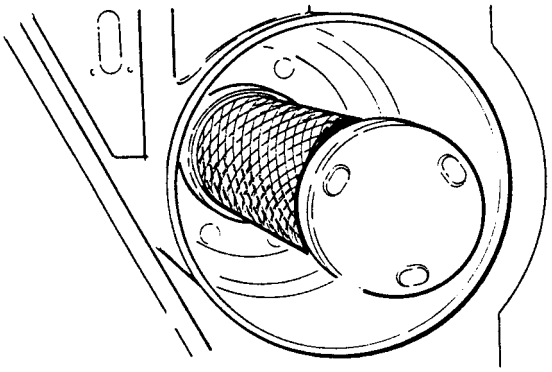


Illustration 177 g00600142

3. The secondary element is a tight fit in the air cleaner housing. Carefully release the secondary element seal by rocking or twisting the secondary element. Remove the secondary element from the air cleaner housing.

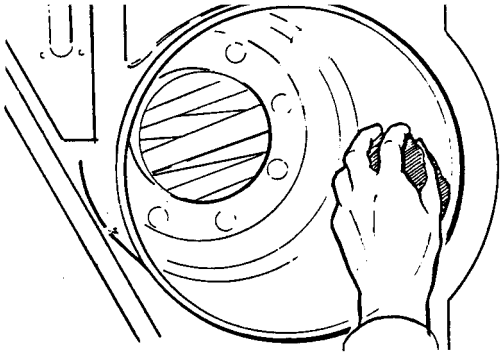


Illustration 178 g00600143

4. Cover the air inlet opening. Clean the inside of the air cleaner housing.
5. Uncover the air inlet opening. Install a new secondary element.
6. Install the primary element and the air cleaner housing cover. Fasten the retaining clips.

i00931397

Engine Air Filter Service Indicator - Inspect

SMCS Code: 7452-040

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

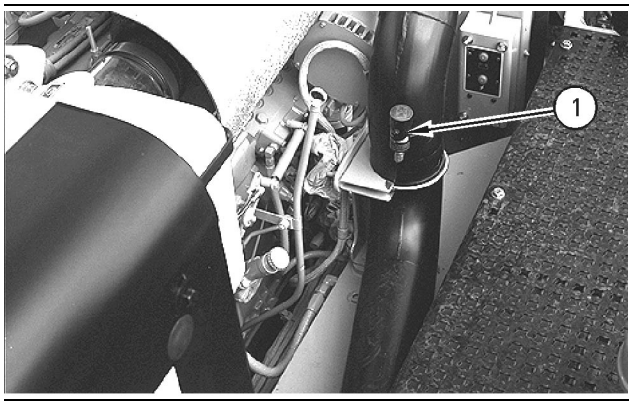
Park the machine on a level surface and engage the parking brake. Lower the dump body and stop the engine.

The air filter service indicator is located inside the engine compartment. The air filter service indicator is mounted onto the air intake pipe, adjacent to the engine oil dipstick.

Note: There are two types of air filter service indicator that can be installed into the air inlet system. The air filter service indicator can be cylindrical in shape, or in the shape of a bowl.

The air filter service indicator can be inspected when the engine is running or stopped.

1. Raise the hood. Use a clean towel and remove any accumulated dust from the air filter service indicator.



g00601030

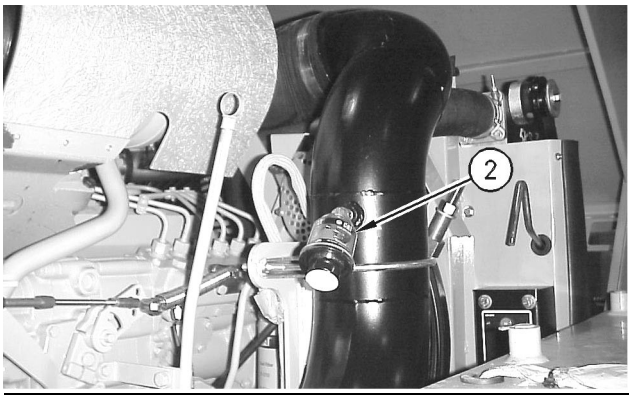
Illustration 179

Type 1. Indicator

2. Inspect air filter service indicator (1) for contamination of the fresh air filter.

Note: The air filter service indicator has four indicator sight glass windows. Two of the indicator sight glass windows are normally yellow in color and two of the indicator sight glass windows are normally green in color. The two indicator sight glass windows that are normally yellow in color will gradually turn to a red color as the fresh air filter becomes blocked. The amount of red showing in the yellow indicator sight glass window will indicate the condition of the fresh air filter.

3. If the indicator sight glass window that is normally green in color shows a 100% red indication, service the fresh air filter.



g00639730

Illustration 180

Type 2. Indicator

4. Inspect air filter service indicator (2) for contamination of the fresh air filter.

Note: The air filter service indicator is a transparent glass bowl. A yellow colored spring loaded piston is installed in the center of the indicator. Two working areas are imprinted onto the internal surface of the transparent glass bowl. One working area is green in color and one working area is red in color. The working area that is green in color is marked with a graduated scale. The graduated scale indicates the condition of the fresh air filter. The working area that is red in color indicates immediate servicing of the fresh air filter. The yellow piston gradually moves from the green working area to the red working area as the fresh air filter becomes blocked.

5. If the yellow piston shows in the red working area of the air filter service indicator, service the fresh air filter.

Refer to the Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace”.

Refer to the Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace”.

6. After you have inspected the air filter service indicator and after you have carried out the necessary maintenance, the indicator should be reset. In order to reset the air filter service indicator, depress the base of the indicator with your thumb.

Note: The reset procedure for air filter service indicators (1) and (2) is identical.

7. Lower the hood.

i00955967

Engine Air Precleaner - Clean

SMCS Code: 1055-070

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

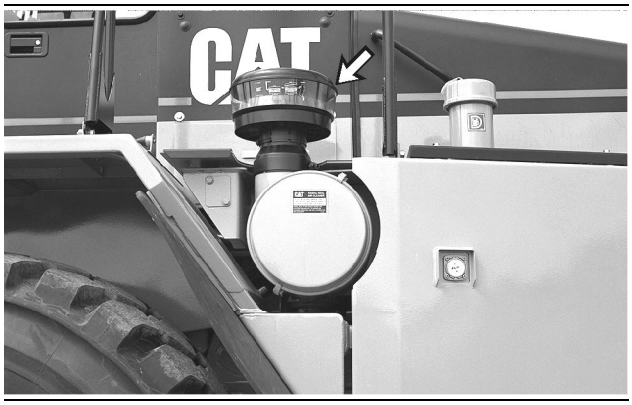


Illustration 181 g00601487

The engine air precleaner is located on the front right side of the tractor.

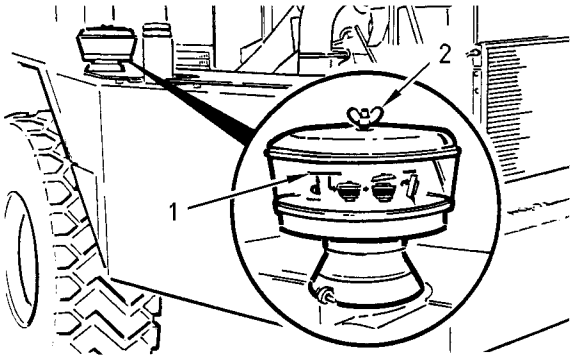


Illustration 182 g00601488

1. Inspect the precleaner bowl. The precleaner bowl must be emptied when dirt reaches indicator mark (1).

2. Loosen wing nut (2). Remove the cap and empty the precleaner bowl. Wipe the precleaner bowl. If necessary, wash the precleaner bowl and the cap in clean, warm water. Use a clean, dry cloth in order to dry the precleaner bowl and the cap.

3. Install the precleaner bowl and the cap. Use your fingers in order to tighten the wing nut. Do not use a tool.

i00956057

Engine Crankcase Breather - Clean

SMCS Code: 1317-070

1. Raise the hood.

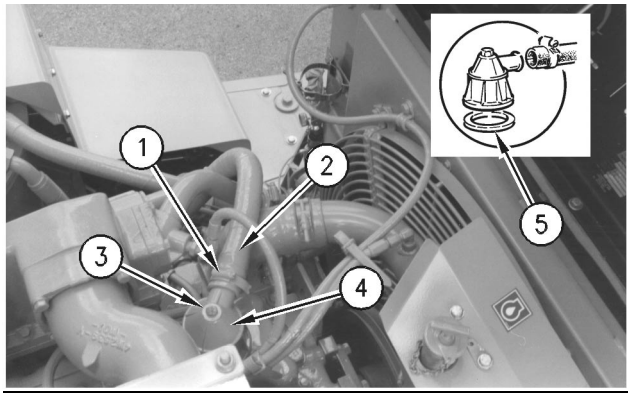


Illustration 183 g00601042

2. Release hose clamp (1) and disconnect hose (2).

3. Unscrew bolt (3) and remove breather (4).

4. Wash the breather in a clean, nonflammable solvent. Wipe the breather with a clean, dry cloth.

5. Inspect breather seal (5). If necessary, install a new seal.

6. Shake the breather until the breather is dry. You may also use pressurized air to dry the breather. Install the breather.

7. Inspect the hose for damage. If the hose is damaged, replace the hose.

8. Install hose (2) to the breather, and secure the hose with the clamp.

9. Lower the hood.

i00956059

Engine Oil Level - Check

SMCS Code: 1000-535-FLV

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

NOTICE
Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine. Allow the engine to cool.

2. Raise the hood.

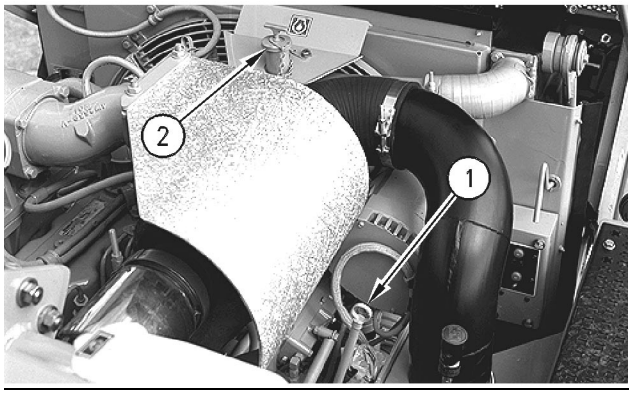


Illustration 184 g00601096

3. Check the “SAFE STARTING RANGE WITH ENGINE STOPPED AND OIL COLD” side of dipstick (1) while the engine is stopped and the oil is cold. Maintain the oil level within the shaded area of the dipstick.

4. Start the engine.

5. While the engine is running at low idle and the oil is warm, check the “ENGINE RUNNING AT LOW IDLE WITH WARM OIL” side of the dipstick. Maintain the oil level between the “ADD” mark and the “FULL” mark.

6. Stop the engine.

7. Remove oil filler cap (2) and add oil, if necessary.

   Refer to the Operation and Maintenance Manual, “Lubricant Viscocities and Refill Capacities”.

8. Clean the oil filler cap and install the oil filler cap.

9. Lower the hood.

i01313050

Engine Oil Sample - Obtain

SMCS Code: 1000-008; 7542-008

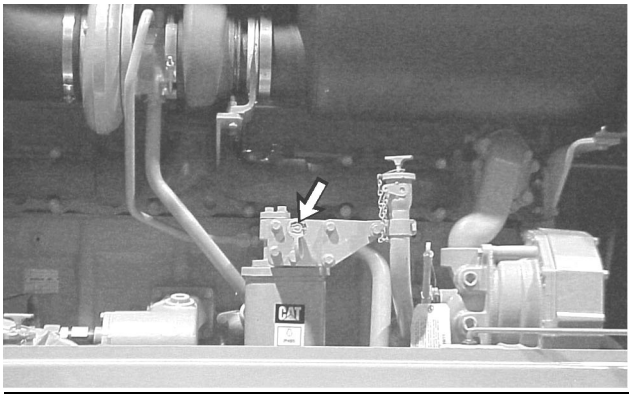


Illustration 185 g00695047

The sampling valve for the engine oil is located on the right side of the engine compartment.

Refer to Operation and Maintenance Manual, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the engine oil.

i00956383

Engine Oil and Filter - Change

SMCS Code: 1318-510

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface and engage the parking brake. Lower the dump body and stop the engine.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining oil and the particles will recirculate in the engine lubrication system with the new oil.

1. Open the hood.

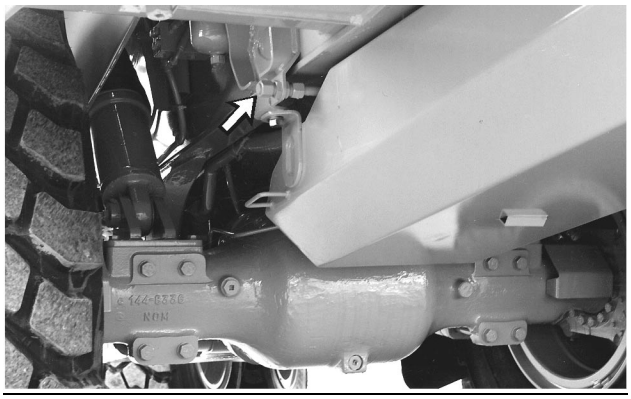


Illustration 186 g00601485

2. Remove the crankcase drain plug. Allow the oil to drain into a suitable container.

3. Clean the crankcase drain plug and install the crankcase drain plug.

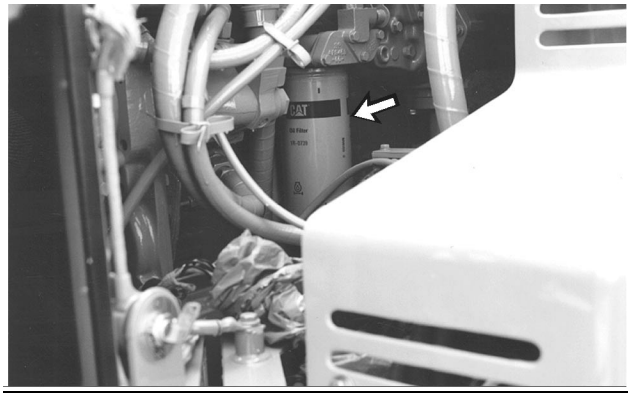


Illustration 187 g00601486

4. Remove the oil filter with a strap type wrench. Discard the used oil filter properly.

Refer to the Operation and Maintenance Manual, “Oil Filter - Inspect”.

5. Clean the oil filter base. Make sure that all of the old oil filter gasket is removed.

6. Apply a thin coat of engine oil to the gasket of the new oil filter.

7. Install the new oil filter by hand. When the gasket contacts the oil filter base, turn the oil filter by 270° more. This will tighten the oil filter sufficiently.

Each new oil filter has rotation index marks that are spaced at 90 degree increments. Use the rotation index marks as a guide for tightening the oil filter.

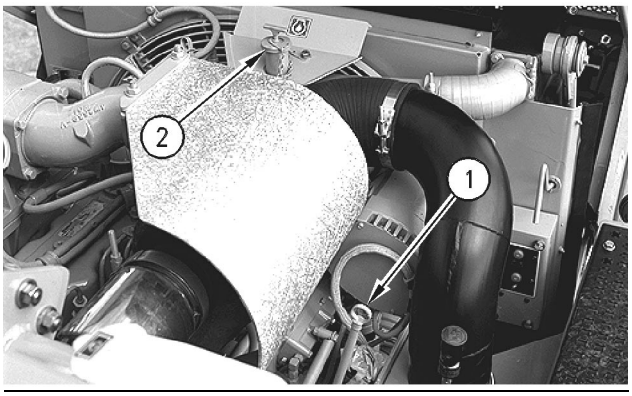


Illustration 188 g00601096

8. Remove oil filler cap (2). Fill the crankcase with new oil. Check the “SAFE STARTING RANGE WITH ENGINE STOPPED AND OIL COLD” side of dipstick(1) while the engine is stopped and the oil is cold. Maintain the oil level within the shaded area of the dipstick. Clean the oil filler cap and install the oil filler cap.

Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

9. Start the engine and allow the oil to warm. Check the engine for leaks.

10. After the engine has been running for ten minutes and the oil is warm, check the “ENGINE RUNNING AT LOW IDLE WITH WARM OIL” side of dipstick (1). Maintain the oil level between the “ADD” mark and the “FULL” mark. If necessary, add oil.

11. Close the hood and stop the engine.

i00128579

Engine Valve Lash - Check

SMCS Code: 1105-535

Maintenance is recommended by Caterpillar for engine valve lash adjustments. The maintenance for engine valve lash is part of the lubrication and preventive maintenance schedule in order to provide maximum engine life.

NOTICE
Only qualified service personnel should perform this maintenance. Refer to the Service Manual or your Caterpillar Dealer for the complete engine valve lash adjustment procedure.

⚠ WARNING

Be sure the engine cannot be started while this maintenance is being performed. To prevent possible injury, do not use the starting motor to turn the flywheel.

Hot engine components can cause burns. Allow additional time for the engine to cool before measuring/adjusting engine valve lash clearance.

NOTICE
Operation of Caterpillar Engines with improper engine valve lash adjustments will reduce the engine efficiency. This reduced efficiency could result in excessive fuel usage and/or shortened engine component life.

Measure the engine valve lash with the engine stopped. To obtain an accurate measurement, allow at least 20 minutes for the valves to cool to engine cylinder head and block temperature.

i00128925

Engine Valve Rotators - Inspect

SMCS Code: 1109-040

⚠ WARNING

When inspecting the valve rotators, protective glasses or face shield and protective clothing must be worn, to prevent being burned by hot oil spray.

Inspect the engine valve rotators after the valve clearances have been set.

1. Start the engine and run the engine at low idle.
2. Watch the top surface of each valve rotator. When the intake valve or the exhaust valve closes, the engine valve rotator should turn slightly.

If an intake valve or an exhaust valve fails to rotate, consult your Caterpillar Dealer.

i00956424

Ether Starting Aid Cylinder - Replace

SMCS Code: 1456-510-CD

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.
2. Raise the hood. The ether starting aid cylinder is mounted on the front left side of the engine compartment.

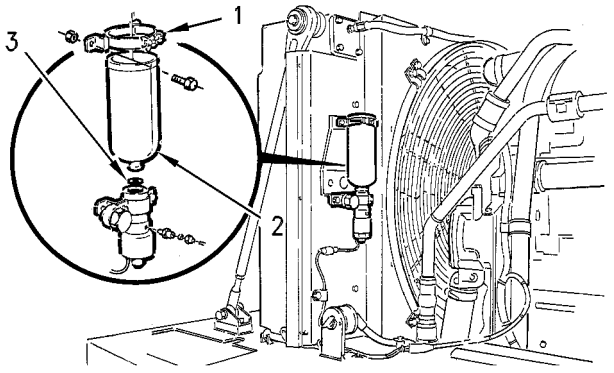


Illustration 189 g00601490

3. Loosen cylinder retaining clamp (1). Unscrew and discard empty ether starting aid cylinder (2).
4. Remove gasket (3). Install a new gasket. A new gasket is provided with each new ether starting aid cylinder.
5. Install a new ether starting aid cylinder. Tighten the ether starting aid cylinder hand tight. Tighten the cylinder retaining clamp securely.
6. Lower the hood.

i00956465

Fan Drive Bearing - Lubricate

SMCS Code: 1359-086-BD

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.
2. Raise the hood.

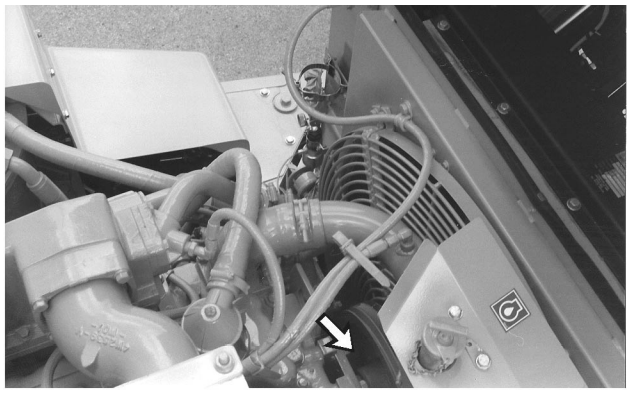


Illustration 190 g00606335

3. The lubricant fitting for the fan drive is located at the front of the engine. The fitting is located on the left side of the mounting for the fan. Wipe the grease fitting before lubricating.

4. Apply lubricant through the fitting for the fan drive bearing.

5. Lower the hood.

   If regular lubrication is carried out at the recommended interval, only two or three shots of grease will be required.

i00956480

Frame and Body - Inspect

SMCS Code: 3250-040; 3260-040; 3268-040; 7000-040; 7050-040; 7113-040; 7258-040

All earthmoving equipment is prone to a high degree of wear. Regular inspections for structural damage are necessary.

These inspections are particularly important for this type of machine as the machines can experience difficult work cycles.

Regular inspections can minimize the risk of accidents. Regular inspections can reduce down time.

The interval between these inspections depends on the factors that follow.

- The age of the machine
- The severity of the application
- The loads that have been carried on the machine
- The condition of the haul road
- The amount of routine servicing that has been carried out

These inspections should be carried out at intervals no longer than 1000 service hours or six months. Older machines, or machines that are operating in severe applications will require more frequent inspections.

If the machine has been involved in a collision, or if the machine has been involved in any kind of accident, the machine must be inspected thoroughly. Inspect the machine regardless of the date of the last inspection.

The machine must be clean before the machine is inspected.

Proper repair of frames and structures requires specific knowledge of the following subjects.

- Materials that have been used to manufacture the frame members
- Frame member construction
- Repair techniques that are recommended by the manufacturer.

Consult your Caterpillar dealer if repairs are necessary. Your Caterpillar dealer is qualified to carry out repairs on your behalf.

All repairs should be carried out by a Caterpillar dealer. If you carry out your own repairs, contact your Caterpillar dealer for advice about proper repair techniques.

Particular attention should be given to all welded structures. The following items should be thoroughly inspected for cracks and for defects:

- Front frame
- Front suspension arms
- Rear frame
- Oscillating hitch
- A-frames
- Dump body

NOTICE

The areas highlighted are of particular importance but other areas must not be neglected. The entire structure must be carefully examined.

Front Frame

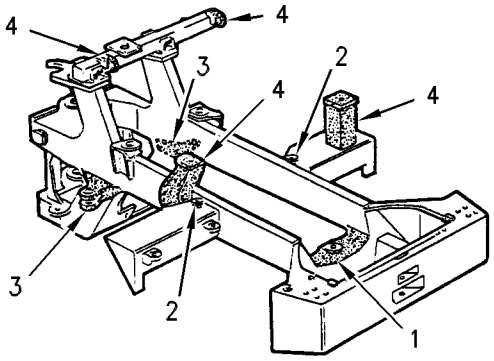


Illustration 191 g00601530

Inspect the following areas:

- Front engine mounting (1)
- Two rear engine mountings (2)
- Steering cylinder lugs (3)
- Cab mounts (4)

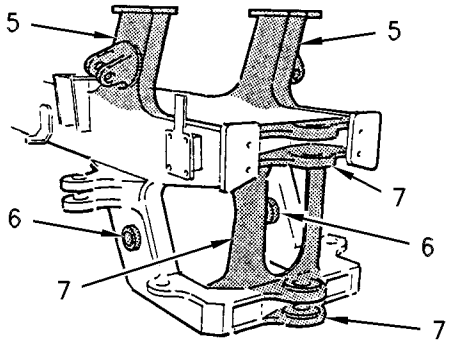


Illustration 192 g00601590

- Suspension towers (5)
- Mounting bosses (6) for the Front suspension arms
- Rear subassembly and hitch lugs (7)

Front Suspension Arms

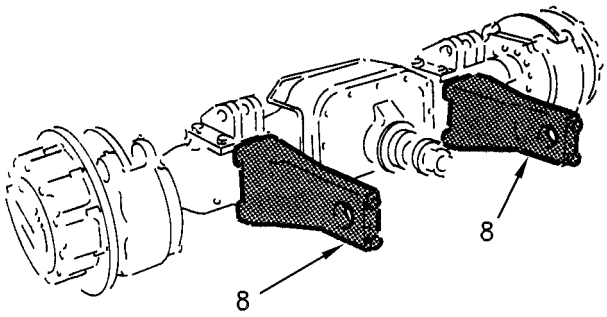


Illustration 193 g00601626

Front suspension arms (8) should be thoroughly inspected.

Oscillating Hitch

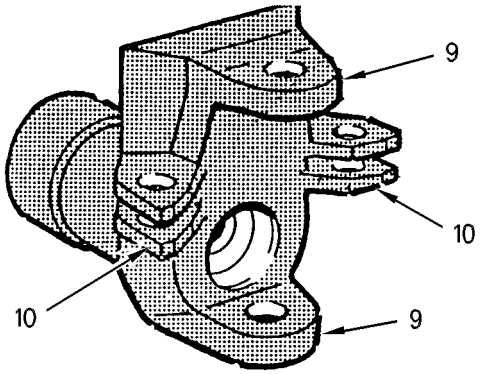


Illustration 194 g00601643

The entire oscillating hitch should be thoroughly inspected. Hitch pin lugs (9) and steering cylinder lugs (10) are particularly important, but all areas of the oscillating hitch must be checked.

Rear Frame

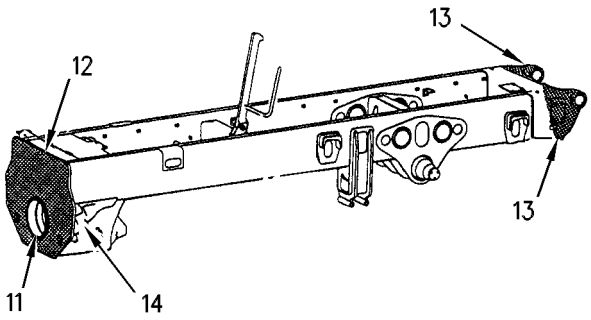


Illustration 195 g00601650

Inspect the following areas:

- Oscillating hitch tube (11)
- Front plate (12)
- Mounting pivots (13) for the dump body
- Mounting brackets (14) for the hoist cylinders

A-Frames

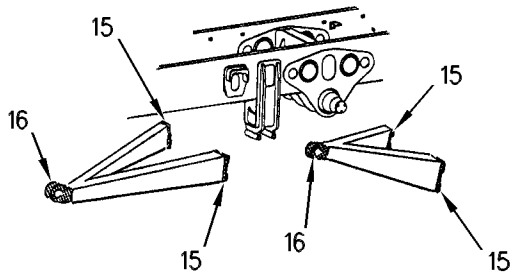


Illustration 196 g00601672

Inspect the following areas:

- Axle mountings (15)
- The pivots for the A-frames (16)

Dump Body

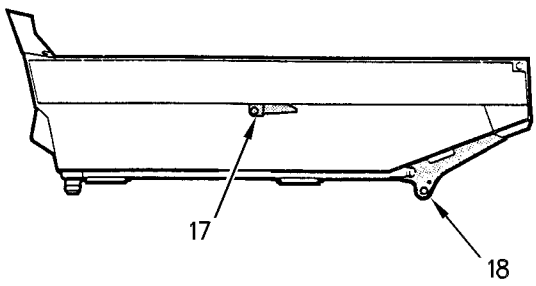


Illustration 197 g00601682

Inspect the following areas:

- The mounting brackets for the hoist cylinders (17)
- The mountings for the dump body (18)

i00850658

Fuel Injection Timing - Check

SMCS Code: 1290-535-TM

Note: The correct fuel timing specification is found on the Engine Information Plate. Fuel timing specifications may vary for different engine applications and/or for different power ratings.

A qualified mechanic should adjust the fuel injector timing because special tools and training are required.

Refer to your Caterpillar dealer for the complete adjustment procedure for the fuel injector timing.

i00956485

Fuel System - Prime

SMCS Code: 1250-548

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

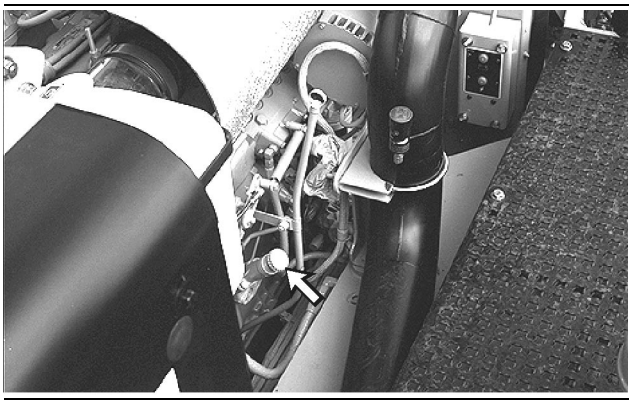


Illustration 198 g00602172

2. Open the hood. The priming pump for the fuel system is positioned in the engine compartment on the right side of the engine.

3. Unlock the priming pump plunger by turning the priming pump plunger counterclockwise and pull out the priming pump plunger.

4. Operate the priming pump in order to fill the new filter element. Continue to operate the priming pump until the pump resists operation. This indicates that the filter element is full of fuel.

5. Lock the priming pump plunger by pushing the priming pump plunger downward and by turning the priming pump plunger clockwise.

6. Start the engine. Look for leaks around the filter element. If the engine will not start, or the engine misfires, more priming of the fuel system is necessary.

7. If the engine is running rough after start-up, shut off the engine. Prime the injection pumps and high pressure fuel lines.

Priming the Injection Pumps and High Pressure Lines

⚠ WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

⚠ WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. Clean up fuel spills immediately.

NOTICE

The fuel injection nozzles can be permanently damaged by twisting if only one wrench is used to loosen or tighten the fuel line nuts.

Use one wrench to hold the nozzle and another to loosen the nut.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

2. Wrap dry cloths around the fuel injection nozzles in order to soak up the fuel.

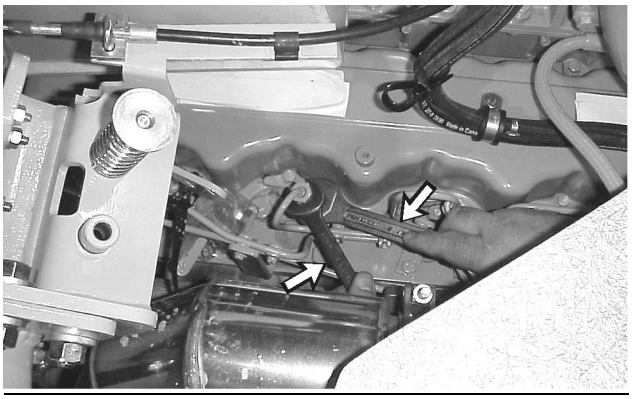


Illustration 199 g00634628

3. Loosen each of the fuel injection line nuts on the cylinder head of the engine.

4. Move the throttle control to the LOW IDLE position.

5. Turn the engine start switch to the START position. Hold the engine start switch in the START position until the fuel flows free of air bubbles from each of the fuel injection lines.

6. Tighten the fuel injection line nuts to a torque of 41 ± 7 N·m (30 ± 5 lb ft).

7. Remove the cloths from the fuel injection nozzles and dispose of the cloths safely. Wipe up spilled fuel.

8. Start the engine and check for leaks.

9. If the engine will not start, more priming of the fuel system is required. If the engine starts but the engine runs rough, continue to run the engine at low idle. Continue to run the engine at low idle until the engine does not run rough.

10. Close the hood.

i00956500

Fuel System Primary Filter - Clean/Inspect/Replace

SMCS Code: 1260-510; 1260-571

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

NOTICE
Do not fill fuel filter with fuel before installing the fuel filter. Contaminated fuel causes accelerated wear to fuel system parts.

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.
2. Raise the hood.

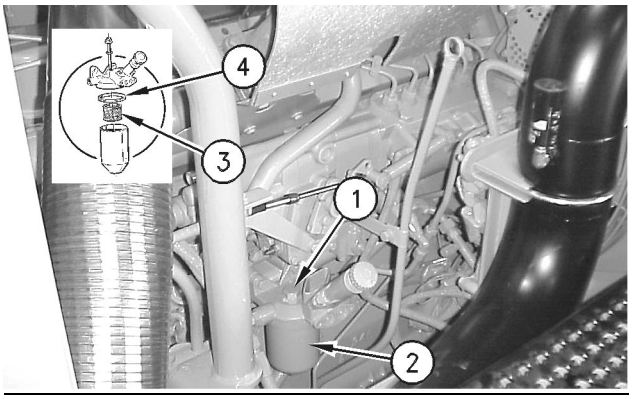


Illustration 200 g00603564

3. Loosen nut (1) and remove filter case assembly (2).
4. Remove fuel filter element assembly (3). Wash the fuel filter element assembly and the filter case assembly in clean, nonflammable solvent.
5. Use pressurized air in order to dry the fuel filter element assembly and the filter case assembly.
6. Inspect gasket (4) for wear. Replace the gasket, if necessary. Coat the new gasket with clean diesel fuel prior to installation.
7. Install the fuel filter element assembly into the filter case assembly. Install the filter case assembly and the new gasket into the filter base. Tighten the nut (1) to a torque setting of 24 ± 4 N·m (17.7 ± 2.9 lb ft) in order to secure the filter case assembly.
8. Prime the fuel system.

   Refer to the Operation and Maintenance Manual, “Fuel System - Prime”.
9. Start the engine and check for leaks.
10. Lower the hood.

i00956596

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510-SE

NOTICE
Do not fill the secondary fuel filter with fuel before installing. The fuel would not be filtered and could be contaminated. Contaminated fuel will cause accelerated wear to fuel system parts.

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: Before you replace the secondary fuel filter, the primary fuel filter must be replaced. Refer to the Operation and Maintenance Manual, “Fuel System Primary Filter - Clean/Inspect/Replace”.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

2. Raise the hood.

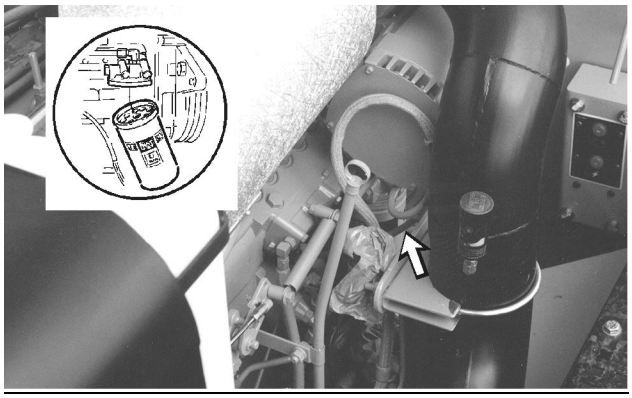


Illustration 201 g00603568

3. Use a strap wrench and remove the secondary fuel filter. Discard the secondary fuel filter properly.

4. Clean the fuel filter base. Ensure that all of the old filter base gasket is removed.

5. Coat the new filter base gasket for the new secondary fuel filter with clean diesel fuel prior to installation.

6. Install the new secondary fuel filter by hand. **Do not use a tool for installation of the secondary fuel filter.** When the new filter base gasket contacts the fuel filter base, tighten the secondary fuel filter by an additional 270°.

   Rotation index marks are positioned on the secondary fuel filter at 90° intervals. Use the rotation index marks as a guide when you tighten the secondary fuel filter.

7. Prime the fuel system.

   Refer to the Operation and Maintenance Manual, “Fuel System - Prime”.

8. Start the engine and check for leaks.

9. Lower the hood.

i00956764

Fuel Tank Cap and Strainer - Clean

SMCS Code: 1273-070-Z2; 1273-070-STR

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

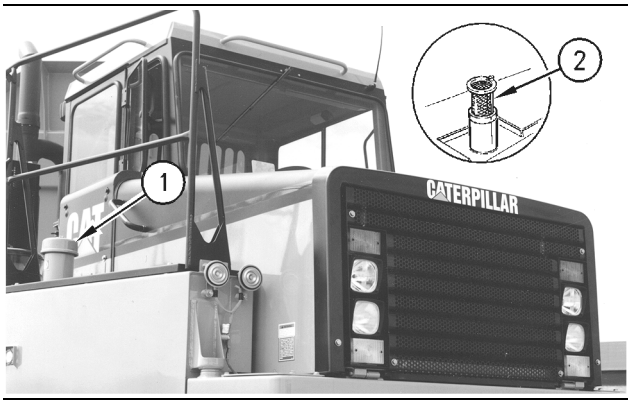


Illustration 202 g00603598

1. Remove fuel tank cap (1) and fuel tank strainer (2).

2. Wash the strainer in clean, nonflammable solvent. If the strainer is damaged, install a new strainer.

3. Dry the strainer.

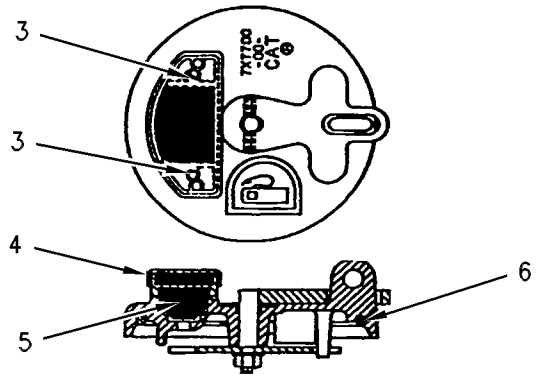


Illustration 203 g00630029

4. Inspect O-ring seal (6) on the fuel tank cap for wear. If necessary, install a new O-ring seal.

5. Remove two screws (3) from the underside of the fuel tank cap. Remove filter assembly (4), drain valve (5) and the gaskets.

6. Install **9X-2205** Cap Filter Kit to the fuel tank cap. Use two screws (3) to secure the Cap Filter Kit in position.

7. Install the fuel tank strainer and the fuel tank cap.

i00956765

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

NOTICE
Fill the fuel tank at the end of each day of operation to drive out moist air and to prevent condensation.

Do not fill the tank to the top. Fuel expands as it gets warm and may overflow.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

At the beginning of the shift, drain the water and the sediment from the fuel tank. After the tank has been filled, allow the tank to stand for ten minutes. When the fuel in the tank has had time to settle, drain the water and the sediment from the fuel tank.

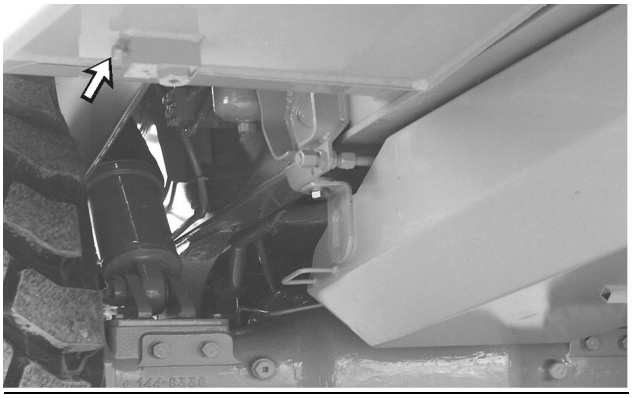


Illustration 204 g00603614

1. Open the purging screw until the water or fuel starts to flow from the drain hole.

2. Allow the fluid and sediment to flow into a suitable container.

3. When the flow from the fuel tank is free of water, close the purge screw .

i01272534

Fuses and Circuit Breaker - Replace/Reset

SMCS Code: 1417-510; 1420-529

Fuses

Illustration 205 g00603664

The fuse panel is located inside the operator compartment.

The fuses protect the electrical system from damage, which can be caused by an electrical overload.

NOTICE
Replace the fuses with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical problem may exist. Contact your Caterpillar dealer

Seat – 15 amp

Horn – 10 amp

Backup Alarm – 10 amp

Radio and Dome Light – 10 amp

Stop Lights – 10 amp

Heated Mirror – 10 amp

Caterpillar Monitoring System – 10 amp

Transmission Control – 10 amp

Retarder Switch – 10 amp

Flood Light – 10 amp

Tail and Dash Panel Lights – 10 amp

Rear Windshield Washer and Wiper – 10 amp

Cigar Lighter – 10 amp

Front Windshield Washer and Wiper – 10 amp

Engine Starting Aid – 10 amp

Electronic System Test Switch – 10 amp

Engine Shutdown Control and Electrical Accessory Socket – 10 amp

Circuit Breakers

The circuit breakers are located on the fuse panels. Push in on the button in order to reset the circuit breaker.

Replacement of the circuit breakers should be done with similar breakers.

i00956772

Hoist Cylinder Bearings - Lubricate

SMCS Code: 5102-086

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Wipe all the fittings before lubricating.

Illustration 206 g00606336

Lubricate the hoist cylinder pins via four fittings. There are two fittings on each side of the machine.

If regular lubrication is performed at the recommended interval, only one or two shots of grease will be required at each fitting.

i00956775

Hydraulic System Oil - Change

SMCS Code: 5056-044

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

2. Lower the front suspension to the service position.

   Refer to the Operation and Maintenance Manual, “Suspension - Lower”.

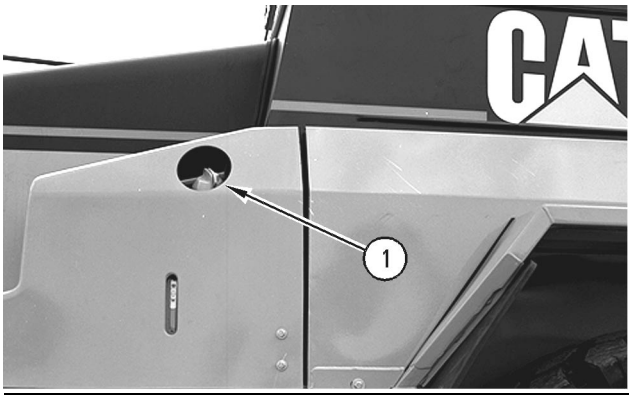


Illustration 207 g00604278

3. Remove the padlock and filler cap (1). Remove the filler cap slowly in order to relieve the pressure.

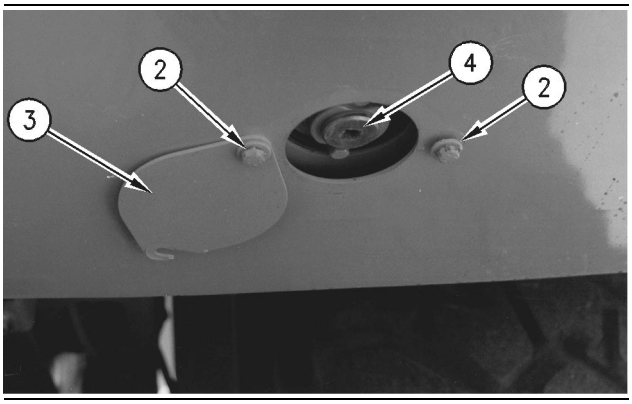


Illustration 208 g00604288

4. Loosen two bolts (2) and rotate cover plate (3) in order to gain access to drain plug (4).

5. Remove the drain plug. Install 6B-3156 Pipe Nipple in order to unseat the drain valve. Allow the oil to drain into a suitable container.

6. Remove the pipe nipple. Inspect the drain plug and the seal for damage. Install the drain plug and seal.

7. Rotate the cover plate and secure the cover plate with the two bolts.

8. Fill the hydraulic tank with new oil.

   Refer to the Operation and Maintenance Manual, “Lubricant Viscocities and Refill Capacities”.

9. Start the engine and operate the engine at low idle.

10. Check that there is adequate vertical clearance. Raise the suspension and lower the suspension.

11. Check that there is adequate sideways clearance. Steer the machine fully to the left and steer the machine fully to the right.

12. Set the front suspension.

Refer to the Operation and Maintenance Manual, “Suspension System - Check/Adjust”.

13. Stop the engine. Allow the machine to stand until all the air bubbles in the oil have been released.

14. Check the oil level. If the oil level is low add more oil.

Refer to the Operation and Maintenance Manual, “Hydraulic System Oil Level - Check”.

15. Check the filler cap and the seal for damage. Install the filler cap. Install the filler cap cover and the padlock.

16. Clean up oil spills.

i00963349

Hydraulic System Oil Filter, Strainer and Breather - Replace/Clean

SMCS Code: 5056-070-STR; 5056-070-BRE; 5056-510-STR; 5056-510-BRE; 5068-070; 5068-510

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

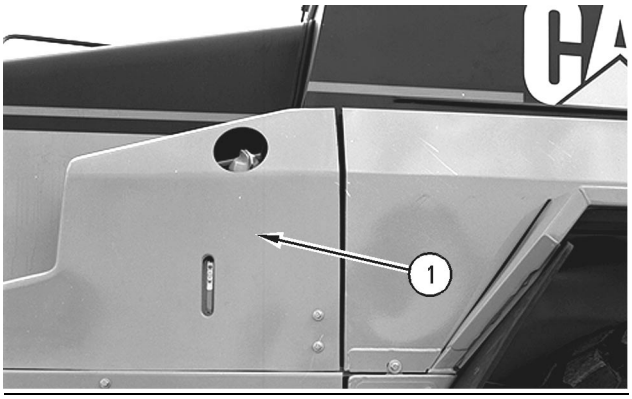


Illustration 209 g00604735

Remove hydraulic tank cover (1).

Strainer

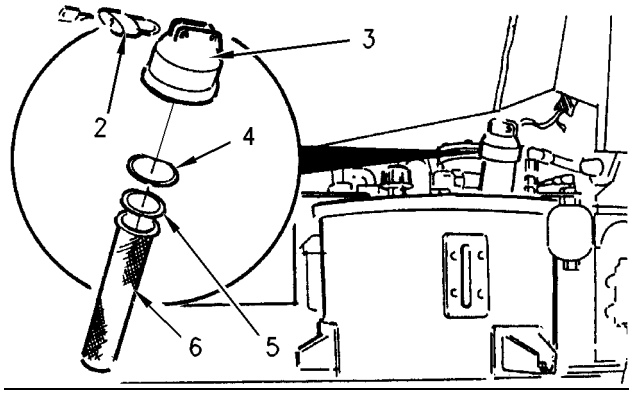


Illustration 210 g00604819

1. Unlock padlock (2) on filler cap (3). Remove filler cap (3) slowly in order to relieve the hydraulic system pressure.

2. Inspect filler cap gasket (4). If necessary, replace the filler cap gasket.

3. Remove retaining ring (5).

4. Pull out strainer (6).

5. Wash the strainer in clean nonflammable solvent. Inspect the strainer for damage. If necessary, replace the strainer.

6. Reinstall the strainer and associated components.

Oil Filter Elements

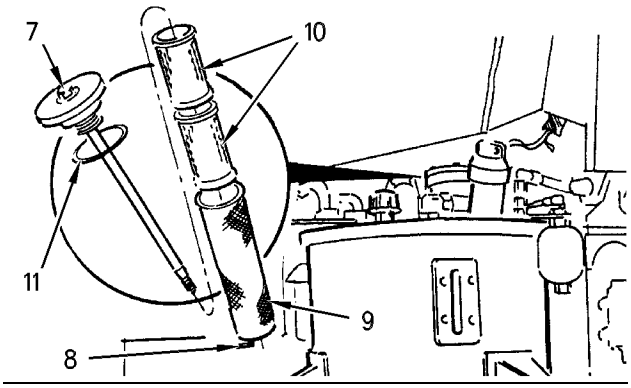


Illustration 211 g00604821

1. Unscrew bolt (7) and remove the screen assembly.

2. Remove cotter pin and washer (8) from bolt (7). Withdraw screen (9) and hydraulic filter elements (10). Discard both filter elements.

3. Wash the screen in clean nonflammable solvent. Inspect the screen for damage. If necessary, replace the screen.

4. Install two new hydraulic filter elements (10) into screen (9).

5. Assemble and reinstall the screen assembly as a unit. If necessary, use a new O-ring seal (11).

Breather

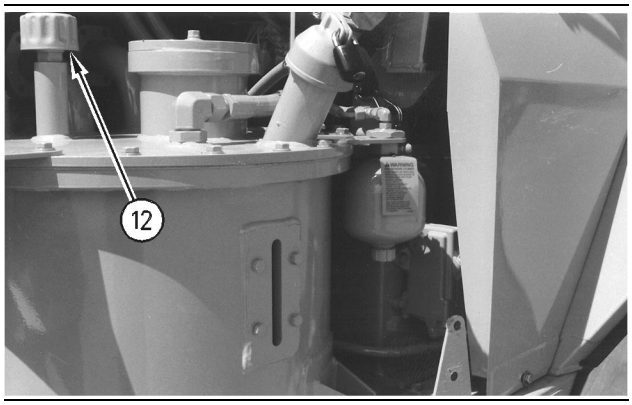


Illustration 212 g00604674

1. Unscrew breather (12).

2. Examine the breather and the breather seal for damage.

3. Reinstall the breather. If necessary, install a new breather.

4. Clean up any spilled oil.

5. Install the hydraulic tank cover (1).

6. Install filler cap (3) and padlock (2).

i00963384

Hydraulic System Oil Level - Check

SMCS Code: 5050-535-FLV

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Ensure that the suspension is at the normal ride height. Check that the oil level is visible on the hydraulic tank sight glass. Fully raise and then lower the dump body.

2. Stop the engine and allow the level of the hydraulic oil to stabilize.

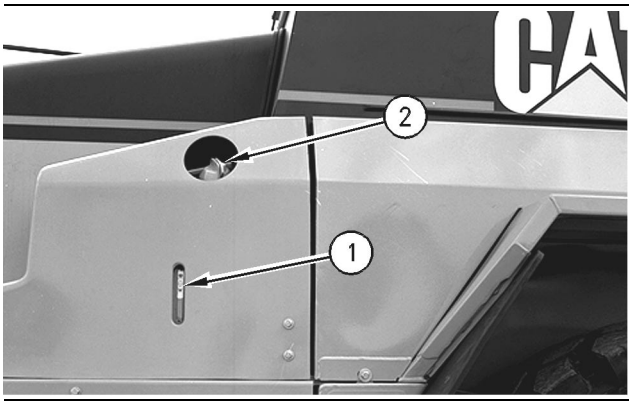


Illustration 213 g00606332

3. The hydraulic oil level is checked on sight glass (1).

4. Unlock the padlock on filler cap (2). Remove the filler cap slowly in order to relieve the hydraulic system pressure.

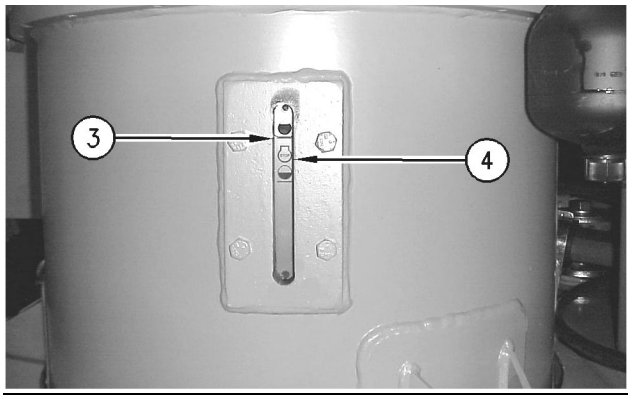


Illustration 214 g00636939

5. The hydraulic oil level must be on the “FULL” indicator mark (3) of the sight glass when the hydraulic oil is at operating temperature. When the hydraulic oil is cold the oil must be at the MID position (4) on the sight glass.

6. If necessary, add system oil through the oil filler tube.

   Refer to the Operation and Maintenance Manual, “Lubricant Viscocities and Refill Capacities”.

7. Clean filler cap (2).

8. Install filler cap (2) and the padlock.

9. Clean up any spilled oil.

Note: The hydraulic tank cover has been removed for clarity on illustration 214. It is not necessary to remove the hydraulic tank cover in order to check the hydraulic oil level.

i00089529

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008; 7542-008

Refer to Operation and Maintenance Manual, “S·O·S Oil Analysis” and Operation and Maintenance Manual, “Sampling Interval and Location of Sampling Valve” for information that pertains to obtaining a sample of the hydraulic oil.

i00963408

Hydraulic Tank Screen - Clean

SMCS Code: 5056-070-Z3

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

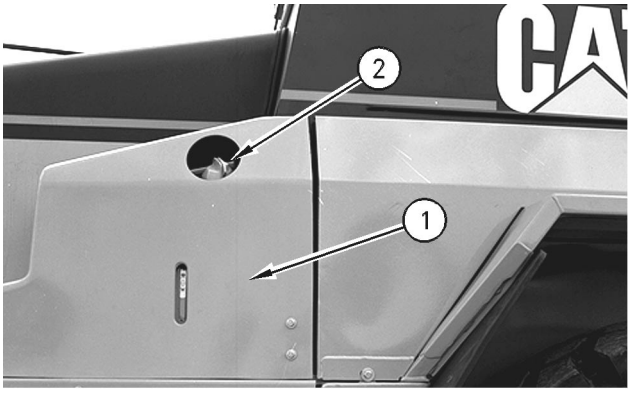


Illustration 215 g00606391

2. Remove hydraulic tank cover (1).

3. Remove the padlock and filler cap cover (2). Remove the filler cap slowly in order to relieve the pressure.

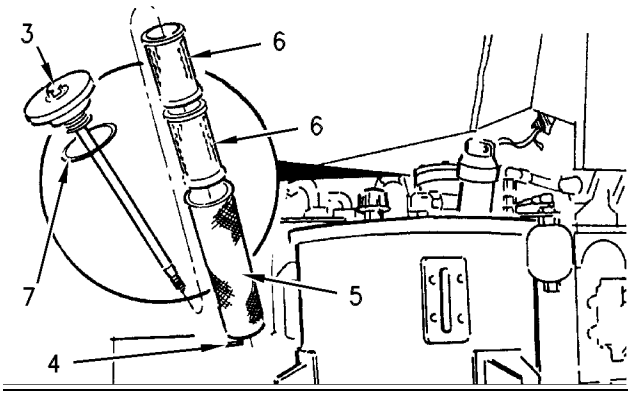


Illustration 216 g00606394

4. Unscrew bolt (3) and remove the screen assembly.

5. Remove the following items: cotter pin and washer (4), screen (5), and hydraulic filter elements (6).

6. Wash the screen in clean, nonflammable solvent and check for damage. If necessary, replace the screen.

7. Assemble and install the screen and hydraulic filter elements. If necessary, replace the O-ring seal (7).

8. Install cotter pin and washer (4).

9. Install the filler cap. Install the filler cap cover and the padlock.

10. Install the hydraulic tank cover.

11. Clean up spilled oil.

i00963410

In-Line Refrigerant Dryer - Check and Replace

SMCS Code: 7322-510; 7322-535

⚠ WARNING

Personal injury can result from contact with refrigerant.

Contact with refrigerant can cause frost bite. Keep face and hands away to help prevent injury.

Protective goggles must always be worn when refrigerant lines are opened, even if the gauges indicate the system is empty of refrigerant.

Always use precaution when a fitting is removed. Slowly loosen the fitting. If the system is still under pressure, release it slowly in a well ventilated area.

Personal injury or death can result from inhaling refrigerant through a lit cigarette.

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas, can cause bodily harm or death.

Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

Use a certified recovery and recycling cart to properly remove the refrigerant from the air conditioning system.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

The in-line refrigerant dryer is located underneath the floor of the cab on the right side of the machine.

The early type of in-line refrigerant dryer has a moisture indicator.

Check

1. Raise the cab in order to gain access to the in-line refrigerant dryer.

Refer to the Operation and Maintenance Manual, “Cab Tilt”.

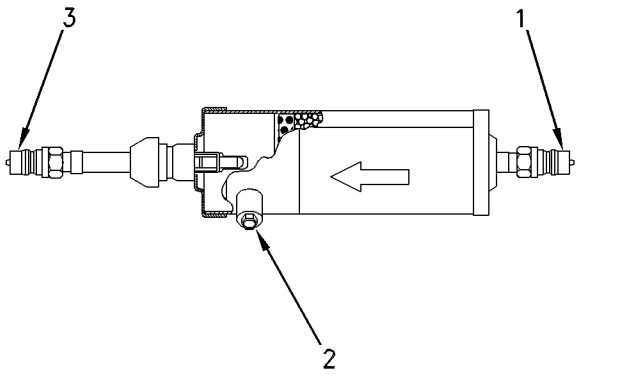


Illustration 217 g00387392

2. Check moisture indicator (2) on the in-line refrigerant dryer. If the moisture indicator is pink, replace the in-line refrigerant dryer. The moisture indicator should always be checked at the end of the summer.

Use the following procedure in order to replace the in-line refrigerant dryer.

Replacement

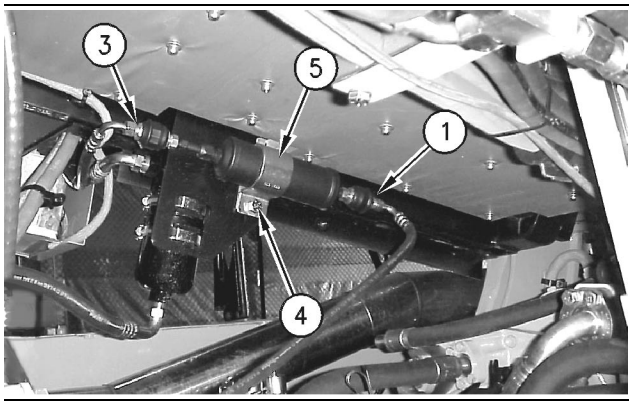


Illustration 218 g00606435

1. Allow the air conditioning system to remain inactive for five minutes in order to equalize the pressure.

2. Remove bolt (4), the washer and clip (5) in order to lower the used in-line refrigerant dryer.

3. Disconnect the “IN” hose (1) from the used in-line refrigerant dryer. Disconnect the hose at the quick coupler.

4. Connect the “IN” hose (1) that was disconnected in Step **3** to the “IN” hose coupler on the new in-line refrigerant dryer.

5. Start the engine and operate the air conditioning system for one minute in order to evacuate the refrigerant from the used in-line refrigerant dryer.

6. With the air conditioning system in operation, disconnect the “OUT” hose (3) from the used in-line refrigerant dryer. Disconnect the hose at the quick coupler.

7. Stop the engine. The air conditioning system must be idle for five minutes in order to equalize the pressure.

8. Connect the “OUT” hose (3) that was disconnected in Step **6** to the coupler on the new in-line refrigerant dryer.

9. Secure the in-line refrigerant dryer in position with bolt (4), the washer and clip (5).

10. Lower the cab.

i01479169

Oil Filter - Inspect

SMCS Code: 1308-507; 3067-507; 5068-507

Inspect A Used Filter for Debris

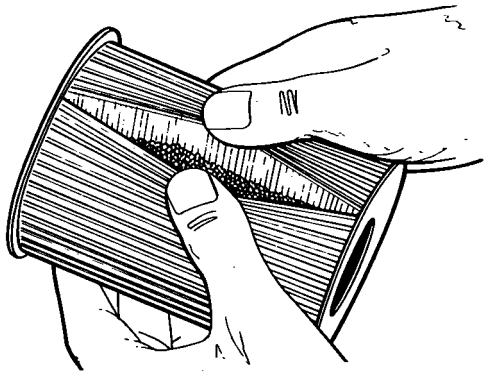


Illustration 219 g00100013

The element is shown with debris.

Use a **4C-5084** Filter Cutter or a **175-7546** Oil Filter Cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i00966761

Oscillating Hitch - Adjust

SMCS Code: 7113-025

Note: Park the machine on level ground before you attempt to adjust the oscillating hitch. **Relieve the tension from the thrust flange prior to adjusting the end play of the oscillating hitch.**

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Illustration 220 g00631488

Install the steering frame locks.

Adjusting Hitch Pin Clearance

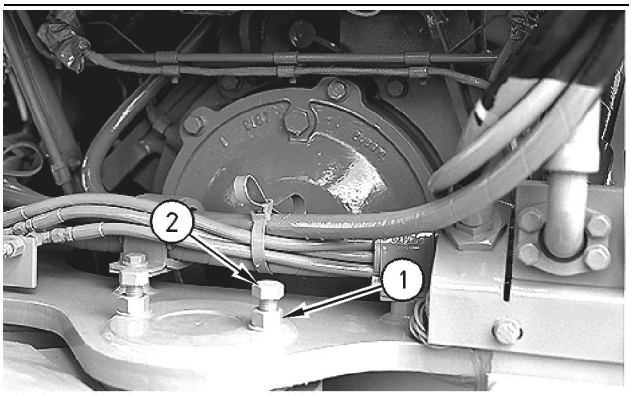


Illustration 221 g00601480

1. Loosen jam nuts (1). Turn adjusting screws (2) clockwise onto the top of the thrust ring. Turn the adjustment screws evenly in order to take up excessive clearance. **Do not overtighten the screws.**

2. Back off the adjustment screws by 180°. Tighten jam nuts (1).

Adjusting End Play

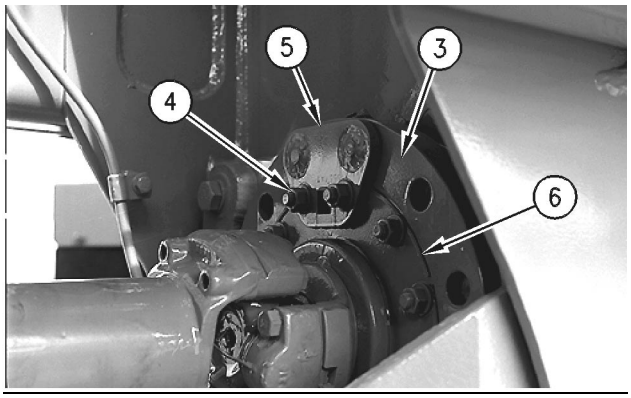


Illustration 222 g00601481

1. The end play of the hitch is adjusted by turning thrust flange (3).

2. Relieve the tension from the oscillating hitch. Place a large block of timber behind the rear wheels of the machine and reverse the machine against the block.

3. Remove two nuts and associated washers (4) that secure locking plate (5) to carrier (6). Separate locking plate (5) from thrust flange (3) and carrier (6).

Note: Locking plate (5) and a suitable wrench are used together as an adjustment tool.

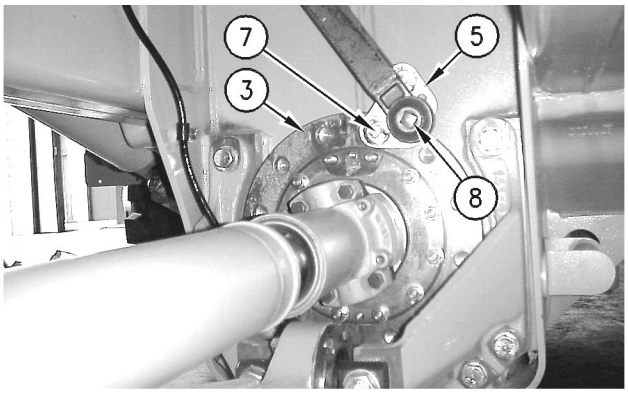


Illustration 223 g00631489

4. Position locking plate (5) against thrust flange (3). Engage one of the dowels (7) into one of the holes in thrust flange (3).

5. Insert a 3/4 inch square drive (8) through the square hole in locking plate (5). Turn the locking plate until the square drive is in contact with the outer rim of thrust flange (3).

6. Put a suitable wrench onto square drive (8) and turn thrust flange (3) clockwise in order to take up end play. Turn thrust flange (3) in order to allow the dowels in the locking plate to be located in the next attainable hole.

Note: If the hitch cannot be adjusted by one hole, turn thrust flange (3) counterclockwise back to the original position. Replace locking plate (5).

7. Remove the wrench and square drive and reposition the locking plate. Install the locking plate with the existing hardware.

i01130739

Oscillating Hitch - Lubricate

SMCS Code: 7113-086

NOTICE
Check that lines attached to remote grease fittings are undamaged. If the lines are split grease will not reach the bearings or pins. Machine damage will result.

The hitch bearings must be lubricated regularly. Rapid wear will result from inadequate lubrication.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

If regular lubrication is carried out at the recommended interval, the fittings for the oscillating hitch pins should only take one or two shots of grease. As many as twenty shots of grease may be used in order to lubricate the bearings for the oscillating hitch.

1. Install the steering frame locks. Refer to Operation and Maintenance Manual, “Steering Frame Lock”.

2. Before you lubricate the fittings, wipe the fittings in order to clean the fittings.

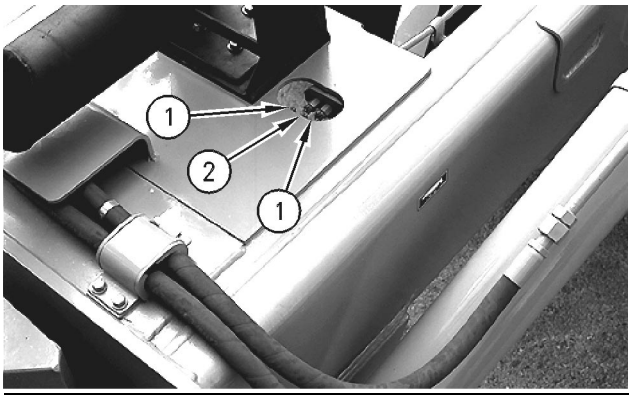


Illustration 224 g00598202

3. Lubricate the hitch bearings through fittings (1). Fitting (2) is initially used to fill the cavity between the two hitch bearings. This fitting does not require regular lubrication.

Illustration 225 g00598500

4. Lubricate the hitch pins through two fittings (3).

5. Remove the steering frame locks.

i01132228

Radiator Core - Clean

SMCS Code: 1353-070-KO

⚠ WARNING

Personal injury can result from air pressure.

Personal injury can result without following proper procedure. When using pressure air, wear a protective face shield and protective clothing.

Maximum air pressure at the nozzle must be less than 205 kPa (30 psi) for cleaning purposes.

Illustration 226 g00601737

You can use compressed air, high pressure water or steam to remove dust and other debris from the radiator core. However, the use of compressed air is preferred.

Note: At the same interval, clean the air conditioner condenser.

Refer to Special Publication, SEBD0518, “Know Your Cooling System” for the complete procedure for cleaning the radiator core.

i01131489

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7323-040; 7325-040

NOTICE
Do not attempt to straighten the ROPS structure. Do not repair the ROPS by welding reinforcement plates to the structure.

If there are any cracks in the welds, in the castings, or in any metal section of the ROPS, consult your Caterpillar dealer for repairs.

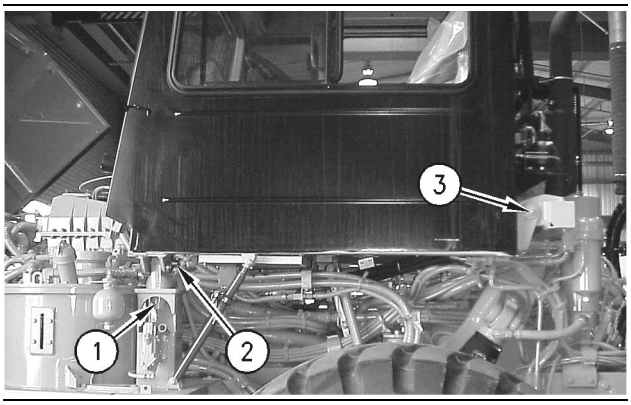


Illustration 227 g00602735

1. The ROPS is held in position by two mounting bolts (1) and two retaining pins (2). One mounting bolt and one retaining pin are located on each side of the cab.

2. Inspect the following items: mounting bolts (1), retaining pins and rubber bushings (2), and pivot pins, rubber bushings and bolts (3). Replace any damaged pins, bolts or rubber bushings with original equipment parts.

3. Tighten mounting bolts (1) to a torque of 1050 ± 150 N·m (775 ± 110 lb ft). Tighten pivot bolts (3) to a torque of 215 ± 40 N·m (160 ± 30 lb ft).

i01271156

Seat - Inspect

SMCS Code: 7312-040

Check the operation of the seat adjustment levers.

Ensure that the seat can be adjusted properly for maximum support for the operator.

Inspect the fabric for the seat cushion for wear and inspect the fabric for the backrest for wear.

If necessary, repair the seat.

i01203202

Seat Belt - Replace

SMCS Code: 7327-510

This machine was shipped from Caterpillar with a factory installed seat belt. The seat belt was installed by meeting the specifications in “SAE J386, JUN85” for a construction machine and in “SAE J386, JUN1993”. Consult your Caterpillar dealer for all replacement parts.

Always check the condition of the seat belt and the condition of the mounting hardware before you operate the machine.

Regardless of the appearance, the seat belt should be replaced after every three years. A date label is attached to each seat belt. Use this label in order to determine the age of the seat belt.

Inspect the seat belt for webbing that is worn or frayed.

Check the buckle for wear or for damage. If the seat belt is worn or if the buckle is damaged, replace the seat belt and/or the buckle.

Inspect the belt mounting hardware. Replace any hardware that is damaged or worn. Make sure that the mounting bolts are tight.

i01263282

Secondary Steering - Test

SMCS Code: 4324

Refer to Operation and Maintenance Manual, “Secondary Steering” for the correct test procedure.

i01130738

Steering Cylinder Bearings - Lubricate

SMCS Code: 4303-086-BD

NOTICE
Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

If regular lubrication is carried out at the recommended intervals, only one or two shots of grease will be required at each fitting. If more than two shots of grease per fitting are required, the lines may be split or damaged, and grease will not reach the steering cylinder pins.

1. Install the steering frame locks. Refer to Operation and Maintenance Manual, “Steering Frame Lock”.

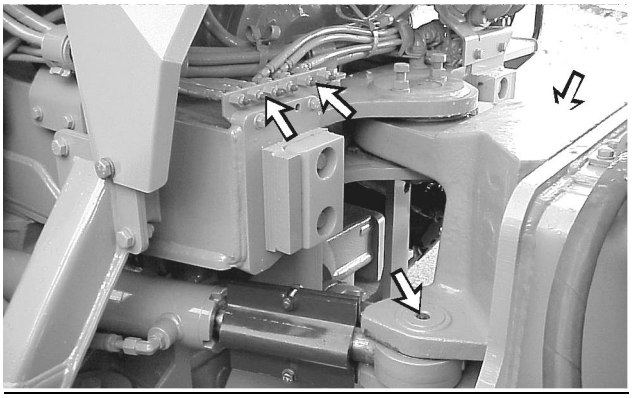


Illustration 228 g00633088

2. Clean all the fittings before you lubricate the fittings.
3. Lubricate the steering cylinder pins through four fittings.
4. Remove the steering frame locks.

i01130955

Suspension Accumulator - Check

SMCS Code: 7200-535-ZJ

Illustration 229 g00631088

The accumulator for the suspension is located behind the cab on the left side of the machine.

The suspension must be fully lowered in order to check accumulator precharge.

Refer to the Operation and Maintenance Manual, “Suspension - Lower”.

Refer to the Service Manual, SENR8535 or your Caterpillar dealer for correct precharge checking and adjusting procedures.

Reset the suspension after the check has been completed.

Refer to the Operation and Maintenance Manual, “Suspension System - Check/Adjust”.

i01130999

Suspension System - Check/Adjust

SMCS Code: 7200-025; 7200-535

Note: The front suspension must be fully lowered for servicing purposes or for shipping. Remove the tie-downs from the tractor frame before you set the suspension.

Lowering the Suspension

Before you lower the suspension, park the machine on a level surface in a convenient position prior to servicing or shipping.

⚠ WARNING

When the suspension is lowered clearances between the machine frames and suspension components are reduced.

Persons on or near the machine could be injured by crushing.

Keep all personnel clear of the machine until the suspension has been lowered.

1. Move the transmission control into the NEUTRAL position. Engage the parking brake and stop the engine.
2. Block the trailer wheels. The tractor wheels must be allowed to rotate as the suspension lowers.
3. Install the steering frame locks. Refer to Operation and Maintenance Manual, “Steering Frame Locks”.
4. Start the engine and disengage the parking brake.

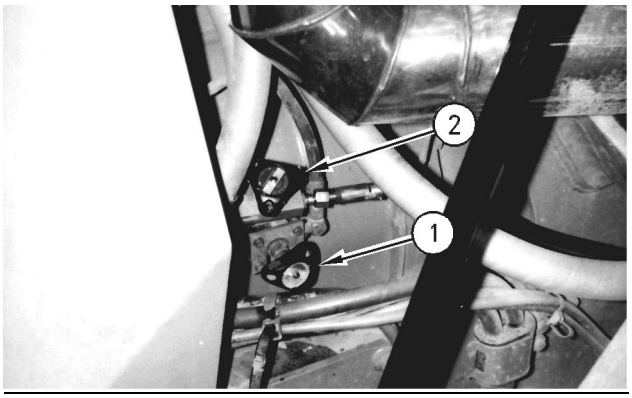


Illustration 230 g00601483

5. Open control valve (1) and control valve (2). Close both control valves when the suspension is fully lowered.
6. Engage the parking brake. Stop the engine and remove the wheel blocks.
7. When shipping or servicing is complete, remove the steering frame locks.

Setting the Suspension

Do not set the suspension until the machine has arrived at the intended destination. Service work must be complete and personnel must be clear of the machine prior to setting the suspension.

Park the empty machine on level ground and block the trailer wheels before you attempt to set the suspension. Install the steering frame locks.

1. Lower the suspension.

Illustration 231 g00601484

2. Measure the distance (A) between the wheel rim and the top surface of the fender.

Note: Due to manufacturing variations, distance (A) between the wheel rim and the top surface of the fender may vary on different machines.

3. Add 90 ± 5 mm (3.54 ± 0.2 inch) to dimension (A) in order to determine the new suspension ride height. Use the new measurement to set the suspension for your machine.

Note: Record the distance (A) between the wheel rim and the top surface of the fender for your machine. The recorded measurement can be used for future reference.

4. Start the engine. Disengage the parking brake.

5. Open control valve (1).

6. Move the hoist control to the HOLD position and then move the control to the LOWER position in order to raise the suspension. Wait until the suspension is fully raised.

7. Move the hoist control to the FLOAT position.

8. Slowly open control valve (2) in order to lower the suspension. Close control valve (2) when the correct suspension ride height is attained. The correct suspension ride height is predetermined in step 3 of this procedure.

9. Close control valve (1).

10. Engage the parking brake and stop the engine. Remove the wheel blocks and remove the steering frame locks.

Note: When major components have been serviced or replaced, the suspension system will require purging. Repeat steps 4 to 8 of the procedure in order to purge the suspension system. Purge the suspension system three times after you replace the components.

i01154879

Suspension and Suspension Cylinder Bearings - Lubricate

SMCS Code: 7200-086-BD; 7201-086-BD

NOTICE
Check that the lines attached to all the remote grease fittings are undamaged. If the grease lines are split, grease will not reach the components that require lubricating. Machine damage will result.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

If regular lubrication is performed at the recommended intervals, only one or two shots of grease will be required at each fitting.

1. Install the steering frame locks. Refer to Operation and Maintenance Manual, “Steering Frame Lock”.

2. Clean all the fittings by wiping before you lubricate the fittings.

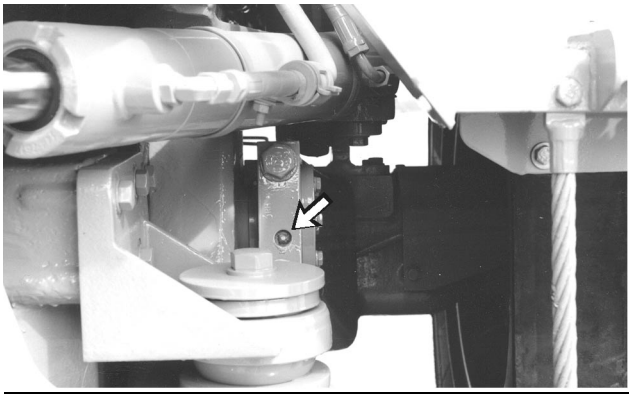


Illustration 232 g00613367

3. Lubricate the front suspension pivot bearings through one fitting on each side of the front suspension frame.

Illustration 233 g00613403

4. Lubricate the spherical bearings for the center and rear suspension frames through two fittings.

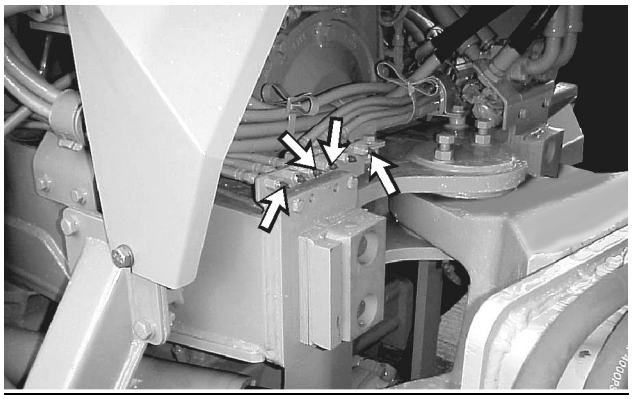


Illustration 234 g00613404

5. Lubricate the suspension cylinder bearings through four fittings.

6. Remove the steering frame locks.

i01130735

Tailgate and Tailgate Cylinder Bearings - Lubricate

SMCS Code: 5107-086-BD; 7271-086-BD

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine. Clean all the fittings by wiping before lubricating the fittings.

If regular lubrication is carried out at the recommended interval the spherical bearings should only take one or two shots.

Illustration 235 g00598780

Each tailgate has two fittings. Apply lubricant to the two fittings in order to lubricate the spherical bearings.

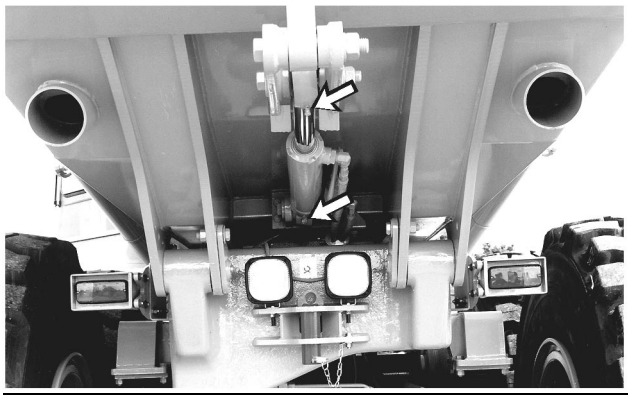


Illustration 236 g00598781

Each tailgate cylinder has two fittings. Apply lubricant to the two fittings in order to lubricate the spherical bearings.

i00062438

Tire Inflation - Check

SMCS Code: 4203-535-AI

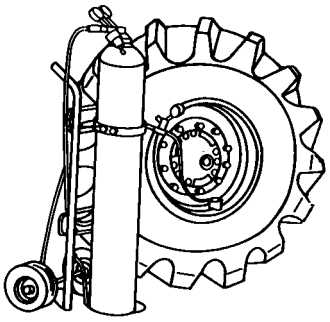


Illustration 237 g00103147

Measure the air pressure on each tire. Consult your Caterpillar dealer for the correct load rating and for the correct operating pressures.

If necessary, inflate the tires. Refer to the following additional information about tire inflation:

- Operation and Maintenance Manual, “Tire Inflation with Nitrogen”
- Operation and Maintenance Manual, “Tire Shipping Pressure”
- Operation and Maintenance Manual, “Tire Inflation Pressure Adjustment”

i01131486

Torque Converter Scavenge Screen - Clean

SMCS Code: 3101-070-Z3

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

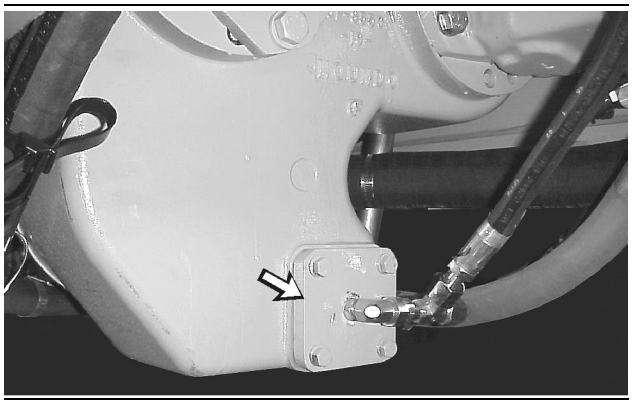


Illustration 238 g00603785

The torque converter scavenge screen is located at the bottom of the torque converter housing.

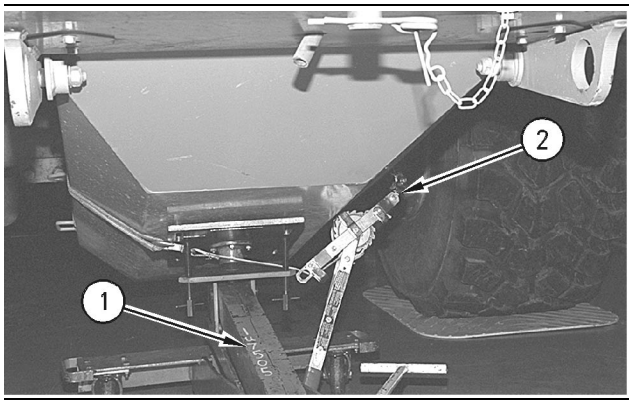


Illustration 239 g00640350

1. Position jack (1) in order to support the rear of the crankcase guard. Use a ratchet hoist with a nylon strap (2) in order to secure the jack to the crankcase guard.

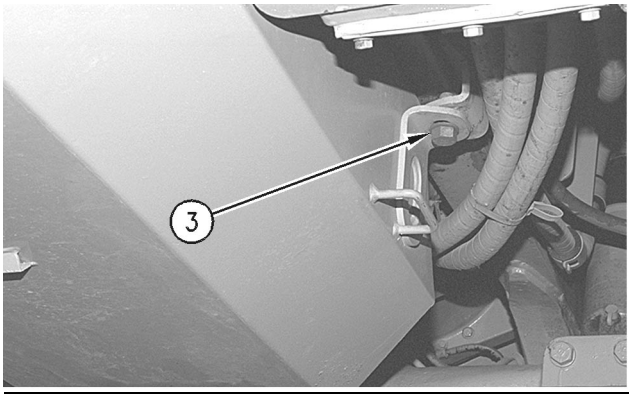


Illustration 240 g00640351

2. Remove two bolts (3) and the washers that secure the crankcase guard to the machine frame. Lower the rear of the crankcase guard to the ground in order to gain access to the torque converter.

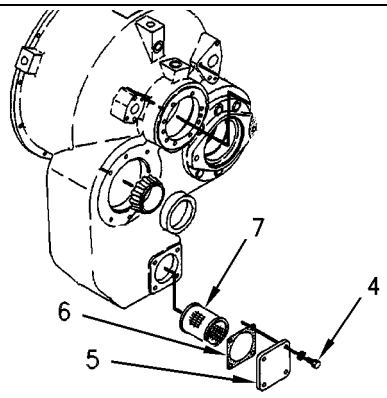


Illustration 241 g00603788

3. Clean the area around cover (5).

4. Place a suitable container below cover (5).

5. Remove four bolts (4) and the washers in order to remove cover (5) and gasket (6).

6. Allow the oil to drain into a suitable container.

7. Remove suction screen (7). Clean the suction screen in nonflammable solvent. Inspect the screen for damage. Replace the suction screen if the screen is damaged.

8. Install the clean suction screen .

9. Clean the cover.

10. Install a new gasket. Install the cover with four bolts (4) and the washers. Tighten the bolts to a torque of 50 ± 7 N·m (37 ± 5 lb ft).

11. Raise the crankcase guard. Secure the crankcase guard in position with two bolts (3) and the washers.

12. Start the engine.

13. Check the area around the torque converter for leaks.

14. Check the transmission oil level. Add oil if oil is needed.

Refer to the Operation and Maintenance Manual, “Torque Converter, Transmission and Tranfer Gear Oil Level - Check”.

Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

i01131488

Torque Converter, Transmission, and Transfer Gear Oil - Change

SMCS Code: 3030-044-OC; 3101-044-OC; 3159-044-OC

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact skin.

Operate the machine until the transmission oil is warm. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine. The drain plug for the transmission oil is located on the bottom of the transfer gear case.

1. Install the steering frame locks. Refer to Operation and Maintenance Manual, “Steering Frame Lock”.

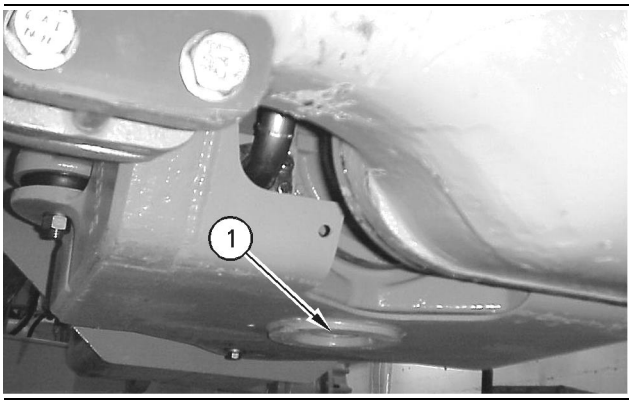


Illustration 242 g00604032

2. Clean the area around drain plug (1).

3. Remove the drain plug and allow the warm oil to drain into a suitable container.

4. Clean the drain plug and inspect the gasket. Lubricate the gasket with gear oil. Install the gasket and the drain plug.

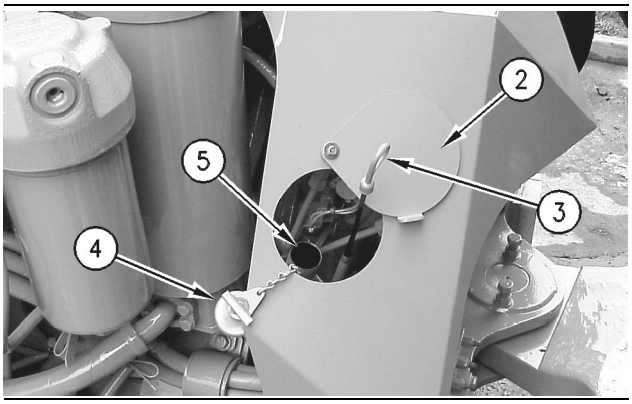


Illustration 243 g00638149

5. The oil level dipstick and the oil filler cap for the transmission oil are located on the left side of the machine under access cover (2). Open the access cover in order to expose oil level dipstick (3) and transmission oil filler cap (4).

6. Clean the area around filler cap (4) and filler tube (5). Remove the filler cap. Fill the transmission with new oil through the filler tube. Fill the transmission to the “COLD SAFE START” mark on the oil level dipstick. Refer to the Operation and Maintenance Manual, “Refill Capacities” and the Operation and Maintenance Manual, “Lubricant Viscosities”.

7. Clean the oil filler cap. Install the oil filler cap.

8. Start the engine. Run the engine at low idle. Inspect the transmission for leaks.

9. Ensure that the parking brake is fully engaged. Apply the service brakes. Slowly operate the transmission control in order to circulate the oil.

10. Maintain the transmission oil level at the “FULL HOT LOW IDLE” mark on the oil level dipstick. Add oil through the filler tube, if necessary.

11. Stop the engine.

12. Clean up oil spills.

13. Close the access cover and remove the steering frame locks.

14. Operate the machine. Allow the machine to stabilize at low idle for five minutes. Check the transmission oil level. Refer to Operation and Maintenance Manual, “Torque Converter, Transmission and Transfer Gear Oil Level - Check”.

i01130375

Torque Converter, Transmission, and Transfer Gear Oil Filter - Replace

SMCS Code: 3067-510; 3101-510-FI; 3159-510-FI

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

1. Install the steering frame locks.

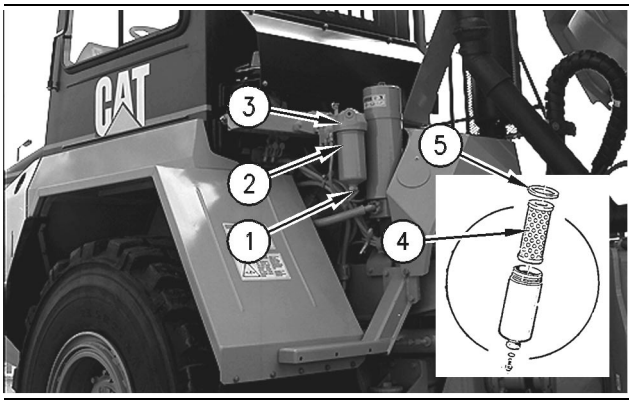


Illustration 244 g00603193

2. Remove oil filter drain plug (1) from transmission oil filter (2) and allow the oil to drain into a suitable container.

3. Clean the outer surface of the transmission oil filter housing. Remove transmission oil filter housing (2) from transmission oil filter base (3).

4. Remove hydraulic element assembly (4) from transmission oil filter housing (2). Discard the used element.

5. Wash the oil filter housing in clean, nonflammable solvent. Wipe the oil filter housing dry.

6. Install oil filter drain plug (1) and a new hydraulic element assembly (4) into transmission oil filter housing (2).

7. Inspect seal (5) in the transmission oil filter base (3). Install a new seal if the seal is damaged.

8. Install transmission oil filter housing (2) together with hydraulic element assembly (4) into transmission oil filter base (3). Tighten the transmission oil filter housing to a torque setting of 100 ± 20 N·m (70 ± 15 lb ft).

9. Start the engine and check for leaks from the transmission oil filter housing. If oil leakage is evident, remove the oil filter and repeat the replacement procedure.

10. Check the transmission oil level. If necessary, add more oil. Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

11. Clean up oil spills.

12. Remove the steering frame locks.

i01130737

Torque Converter, Transmission, and Transfer Gear Oil Level - Check

SMCS Code: 3030-535-FLV; 3101-535-FLV; 3159-535-FLV

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

You should check the oil level before you start the engine. The machine should be parked on a level surface and the parking brake should be applied.

Illustration 245 g00598506

The oil level dipstick and the oil filler for the transmission oil are located on the left side of the machine under the access cover.

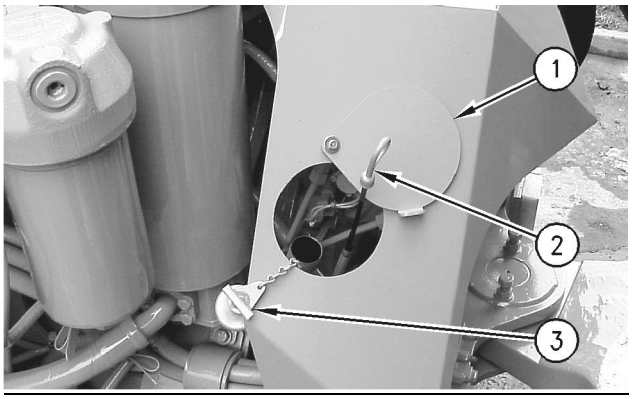


Illustration 246 g00671471

The oil filler cap has been removed from the filler tube.

The oil level dipstick has been partially removed.

1. Open access cover (1) in order to expose oil level dipstick (2) and filler cap (3).

2. Remove the oil level dipstick.

Illustration 247 g00639014

Note: The oil level dipstick is marked “COLD SAFE START”on one side. The oil level dipstick is marked “FULL HOT LOW IDLE” on the other side.

3. The side of the oil level dipstick that is marked “COLD SAFE START” has a range that indicates the oil level.

The engine can be started if the oil is anywhere in this range. **Do not add oil if the level is toward the bottom of the “COLD SAFE START” range.** A oil level that is anywhere in this range is normal.

4. Remove the steering frame locks. Start the engine. Operate the machine until the temperature of the oil is near the operating temperature.

5. Park the machine on a level surface. Apply the parking brake. Stop the engine. Install the steering frame locks.

6. Start the engine. Run the engine at an idle for five minutes before your check the oil. Remove dipstick (2). The side of the oil level dipstick that is marked “FULL HOT LOW IDLE” indicates the correct transmission oil level.

7. If necessary, add oil. Refer to Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

8. Stop the engine. Close the access cover and remove the steering frame locks.

i01130854

Torque Converter, Transmission, and Transfer Gear Oil Sample - Obtain

SMCS Code: 3030-008; 3101-008; 3159-008; 7542-008

Illustration 248 g00638148

Sample the oil when the oil is warm.

Park the machine on a level surface. Apply the parking brake. Stop the engine. Install the steering frame locks. Start the engine.

Obtain a sample of the oil. A sampling valve for this purpose is located on the transmission oil filter.

Stop the engine. Remove the steering frame locks.

Use S·O·S oil analysis in order to monitor the condition of your torque converter, transmission, and transfer gear.

i01131487

Transmission Magnetic Screen - Clean

SMCS Code: 3030-070-MGS

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

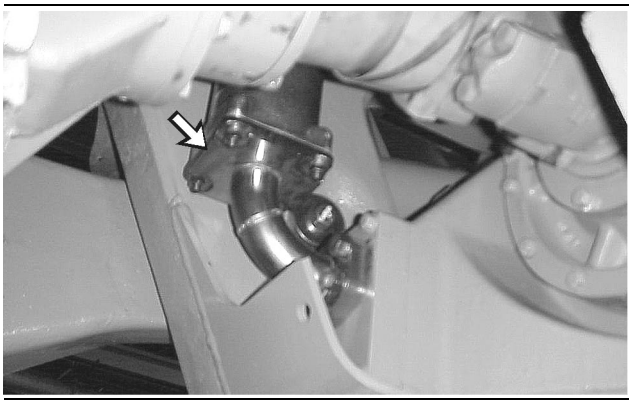


Illustration 249 g00604030

The transmission magnetic screen is located on the right side of the output transfer gear case to the rear of the front axle.

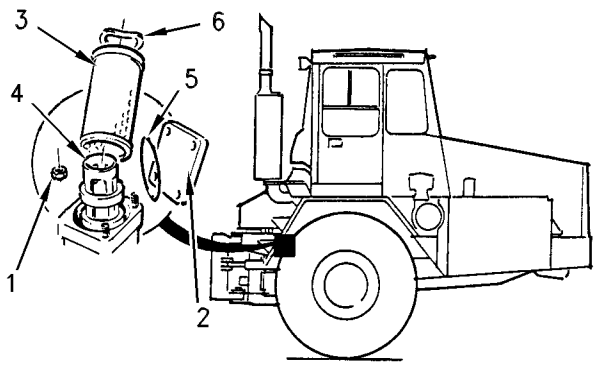


Illustration 250 g00604031

1. Remove nuts (1) and cover (2).

2. Pull out suction screen (3) and magnetic screen tube assembly (4). Take care to avoid dropping or jarring the magnets.

3. Wash the suction screen and magnetic screen tube assembly in clean, nonflammable solvent. Further clean the magnets with a cloth or stiff bristle brush.

4. Install the suction screen and the magnetic screen tube assembly. Ensure that wave washer (6) is in place.

5. Install the cover and secure the cover in position with the nuts. If necessary, use a new seal (5). Tighten nuts (1).

6. Add clean oil to the transmission.

Refer to the Operation and Maintenance Manual, “Transmission and Transfer Gear Oil Level - Check”.

Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Refill Capacities”.

i01161793

Transmission and Transfer Gear Breather - Clean/Replace

SMCS Code: 3030-070-BRE; 3030-510-BRE; 3159-070-BRE; 3159-510-BRE

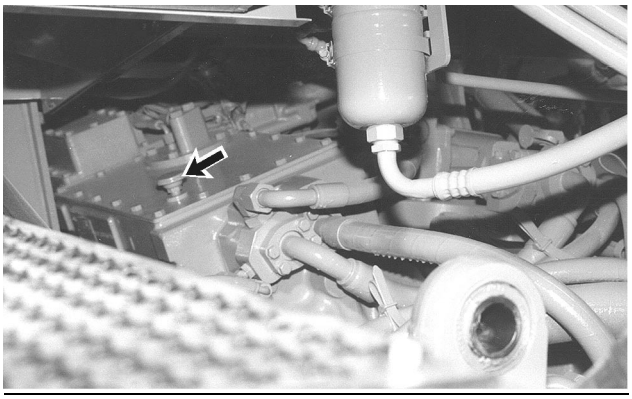


Illustration 251 g00619323

The breather which serves the transmission and transfer gear is located on the top of the transmission.

Loosen and remove the breather. Wash the breather in clean nonflammable solvent. Dry and inspect the breather. If the breather is serviceable, install the breather. If the breather is damaged, install a new breather.

i01154309

V-Belts - Inspect/Adjust/ Replace

SMCS Code: 1357-025; 1357-040; 1357-510

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

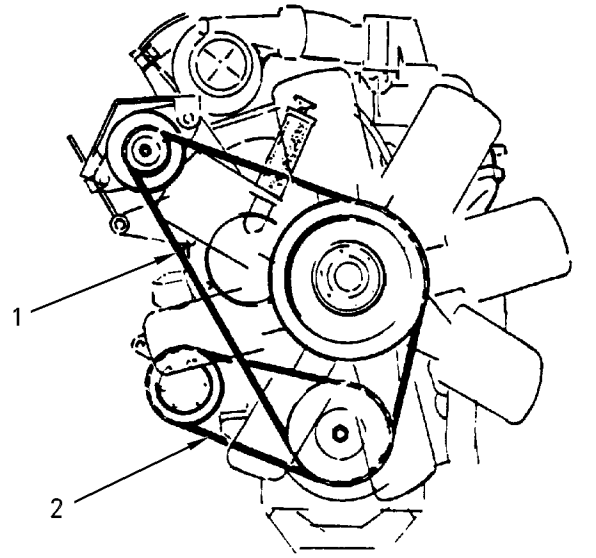


Illustration 252 g00612977

1. Inspect fan drive belt (1) and air conditioner belt (2), if equipped. Check the belts for wear, fraying or cracking. If the belts are damaged, replace the belts. Never replace a single fan drive belt, as the new fan drive belt will quickly break under all the load.

2. Apply a 110 N (24.7291 lb) load to the fan drive belt. This load should be applied midway between the fan drive pulley and the alternator pulley. A correctly adjusted belt set will deflect 15 to 20 mm (.6 to .8 inch). If necessary, adjust the belt tension.

Fan Drive Belt Adjustment

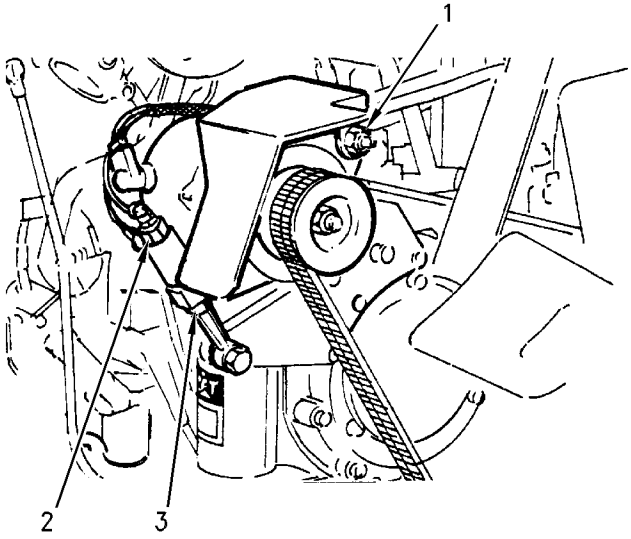


Illustration 253 g00612998

1. Loosen alternator mounting bolt (1) and jam nut (2).

2. Turn adjusting nut (3), until the correct belt tension is achieved.

3. Tighten the jam nut. Check that the tension of the fan drive belt is correct. Tighten the alternator mounting bolt.

Adjustment of Air Conditioner Belt

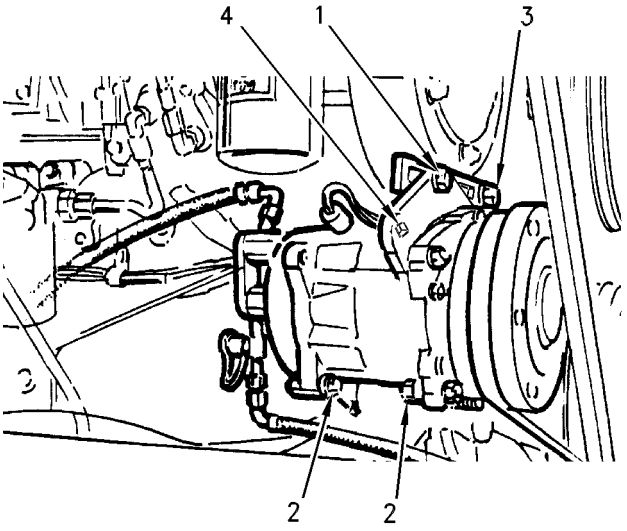


Illustration 254 g00613008

1. Loosen the following bolts: (1), (2), and (3).

2. Use square drive hole (4) in the bracket and pull the compressor outward in order to increase the belt tension. Tighten bolts (1) and (2).

3. Check that the tension of the air conditioner belt is correct. It may be necessary to adjust the tension again. Repeat Steps **1** and **2** in order to adjust the belt tension. Tighten bolt (3). Tighten bolt (1) again.

A correctly adjusted belt will deflect 14 to 20 mm (.56 to .81 inch) under a 110 N (24.7291 lb) load.

i01146478

Walk-Around Inspection

SMCS Code: 7000-040

For maximum service life of the machine, perform a thorough walk-around inspection before you mount the machine and before you start the engine.

1. Inspect the lights for broken bulbs and lenses. Replace the parts that are broken.

2. Inspect the conditions of the steps and handholds. Repair any damaged steps and handholds. Ensure that steps and handholds are clean.

3. Inspect the operator's compartment for cleanliness, and remove trash or debris. Check for broken indicator lights or broken gauge lights. Ensure that the mirrors and lights are clean.

4. Check that the windows are clear of dust, mud or other foreign materials. If necessary, clean the windows.

   Refer to the Operation and Maintenance Manual, "Windows - Clean".

5. Inspect the cooling system for leaks and trash buildup around the radiator and the radiator grill. Check the condition of the radiator hoses and the fan drive belt.

6. Inspect the engine compartment for leaks and trash buildup.

7. Inspect the cab for damage. If repair is necessary, consult your Caterpillar dealer.

8. Inspect the hydraulic system for leaks and damaged hoses or fittings.

9. Inspect the transmission and axles for leaks.

10. Inspect the tires for damage. Ensure that the tires are inflated to the correct pressure. Consult your tire dealer for correct inflation pressures for your particular application. Replace any missing valve caps. Damaged tires must be inspected and repaired by your tire dealer.

11. Look around the machine and under the machine. Look for trash buildup, loose bolts, etc.

i01263613

Wheel Bearings - Check/Adjust

SMCS Code: 7551-025-WHL; 7551-535-WHL

NOTICE

Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, "Caterpillar Tools and Shop Products Guide" for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

1. Install the steering frame locks. Refer to Operation and Maintenance Manual, "Steering Frame Lock".

2. Check and adjust one axle at a time. Block the wheels of the axles that are not being checked.

3. Remove each tire and rim from the final drive and wheel. Refer to Disassembly and Assembly, SENR9128, "Tire and Rim - Remove".

4. Remove the axle shafts. Refer to Disassembly and Assembly, SENR9128, "Axle Shaft - Remove".

5. Remove each final drive. Refer to Disassembly and Assembly, SENR9128, "Final Drive - Remove".

6. Remove the brake linings from each side of the discs in order to allow the wheel assemblies to rotate freely. Refer to Disassembly and Assembly, SENR9129, "Service Brake - Remove".

7. Adjust the bearing preload for each wheel. Refer to Disassembly and Assembly, SENR9128, "Wheel Bearings and Duo-Cone Seals - Install".

8. Install the brake linings. Refer to Disassembly and Assembly, SENR9129, "Service Brake - Install".

9. Install each final drive. Refer to Disassembly and Assembly, SENR9128, "Final Drive - Install".

10. Install the axle shafts. Refer to Disassembly and Assembly, SENR9128, “Axle Shaft - Install”.

11. Install each tire and rim to the final drive and wheel. Refer to Disassembly and Assembly, SENR9128, “Tire and Rim - Install”.

12. Repeat steps 2 to 11 for the remaining axles.

13. Remove the steering frame locks. Remove the wheel chocks.

14. Add oil to each final drive. Refer to Operation and Maintenance Manual, “Differential and Final Drive Oil - Change”.

i01150805

Wheel Nut Torque - Check

SMCS Code: 4210-535

Check the wheel nut torque on any new wheels and on any repaired wheels until the specified wheel nut torque is maintained. Then, check the wheel nut torque of all six wheels at the normal maintenance interval thereafter. Refer to Operation and Maintenance Manual, “Maintenance Interval Schedule”.

Illustration 255 g00610738
Typical Example

Tighten the wheel nuts to a torque of 500 ± 70 N·m (365 ± 50 lb ft).

i01154163

Window Washer Reservoir - Fill

SMCS Code: 7306-544

NOTICE
When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

1. Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

2. Raise the hood.

Illustration 256 g00614341

3. The window washer reservoir is located inside the engine compartment on the right side.

4. Remove the filler cap of the reservoir.

5. Fill the reservoir through the filler opening.

6. Replace the filler cap of the reservoir and lower the hood.

i01154159

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Illustration 257 g00612802

Inspect the front wiper blade. Inspect the rear wiper blade, if equipped.

Replace a wiper blade when the following conditions occur:

- The wiper blade is causing streaks on the front window.
- The wiper blade is causing streaks on the rear window.
- The wiper blade is worn.
- The wiper blade is damaged.

Note: Damaged wiper blades may cause permanent damage to the glass of the cab windows.

i01154158

Windows - Clean

SMCS Code: 7310-070

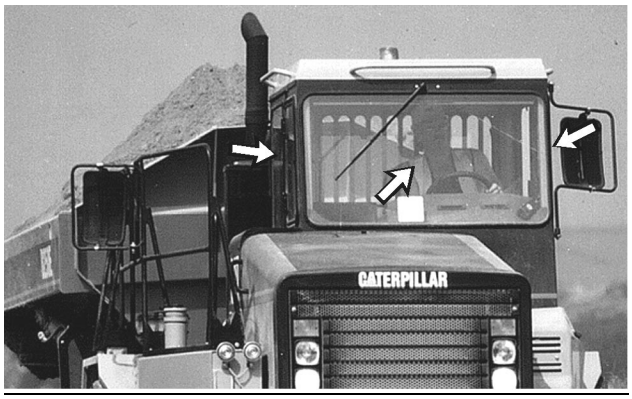


Illustration 258 g00612800

Park the machine on a level surface. Ensure that the parking brake is fully engaged. Lower the dump body and stop the engine.

Use commercially available window cleaning solutions to clean the windows.

When possible, you should stand on the ground in order to clean the outside of the windows. You can also stand on the deck if handholds are available.

Use a mop with a long handle or use step ladders to gain access.